A Database Publication

THE MICRO USER

Volume 7
Number 11
January 1990
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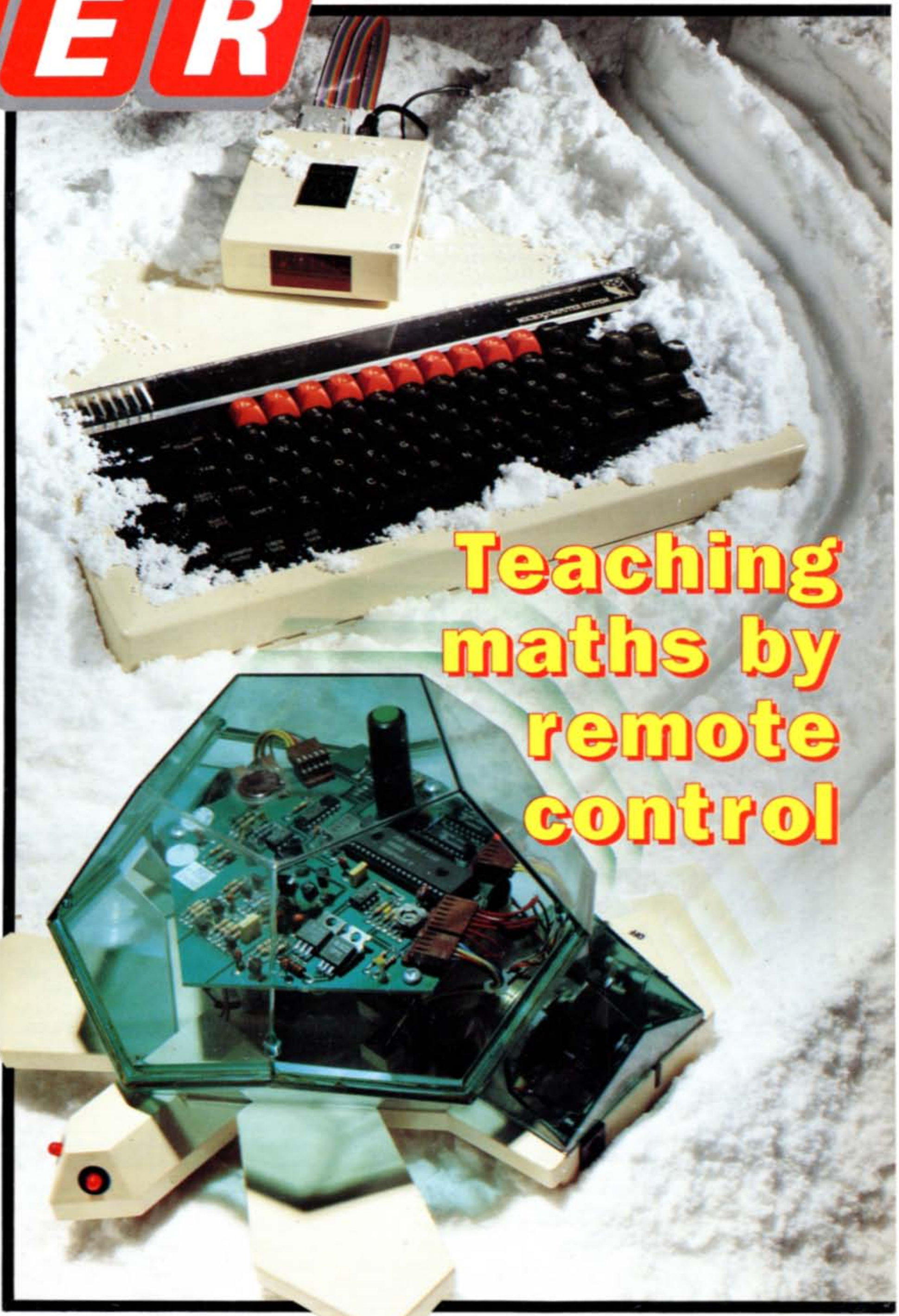

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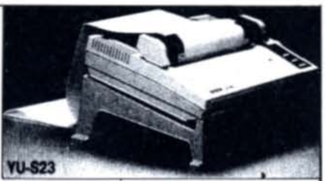

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The Micro User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

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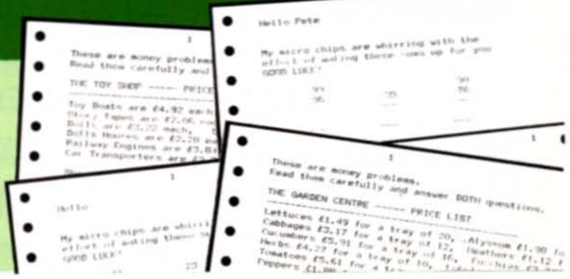
Some sums

Practice makes perfect so we present a useful routine to let you print lots of sums to keep your child occupied for hours.

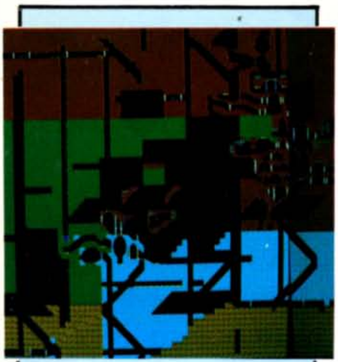
– See Page 30



Hello Pete

These are money problems.
Read them carefully and answer BOTH questions.

THE GARDEN CENTRE ----- PRICE LIST



If you're stuck in this block-busting game you'll find lot's of useful hints, and a map on Page 79.

Just use the decoding program to unravel the clues and you'll be well on your way to the complete solution.

Mock Turtle

As more turtles invade the classroom we take a look at whether they are useful educational tools or just toys. Turn to Page 18.

Amazing offer!

For the price of a single year's subscription you get 15 issues of *The Micro User* plus the disc or tape for each.

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Get your subscription by filling in the form on Page 127.

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MICRO USER CLASSIFIEDS

The best bargains in the world of the BBC Micro come from fellow readers of *The Micro User*. Turn to **Page 124** to find just what you're looking for – from cheap modems to complete computer systems.

Next month in THE MICRO USER

AUTOMATA
Single cell patterns

GET IT RIGHT!
Checksums revisited

IN PRINT
How to write articles

MOGUL
Superb animation

✓ **For full details of how to use the Checksums, see the article on Page 48 of the February 1989 issue of *The Micro User*.**

✱ **The Type-it-in symbol indicates that the feature contains at least one full length listing for you to key in on your micro.**

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Firm that went at Mach speed

RUMOURS which have been simmering over the dealings of Archimedes add-on firm Mach Technology have now boiled over with fraud squad officers moving in and the company going into voluntary creditors' liquidation.

Mach burst on to the scene earlier this year with large and impressive advertisements in the computer press extolling the virtues of its Hyper Base, Modula-2, Mach Basic and Mach-286 add-ons for Archimedes machines.

There was great interest from the public but it soon became apparent that customers sending in cash were not receiving goods.

Advertising bills were not paid, staff could not be contacted by telephone and visitors to the rented office in Yarm Lane, Stockton found no one in. The landlord was owed rent and eventually cut off the electricity.

Finally Cleveland CID were informed and handed over the case to their Fraud Squad colleagues.

Fraud Squad officer David Dixon told *The Micro User* it is unlikely that any criminal proceedings will take place. "It would be difficult to prove dishonesty or outright deception. They just set up in business and got in too deep", said DC Dixon.

The firm called in to wind up Mach Technology is John Taylor and Co., chartered accountants of 8 High Street, Yarm, Cleveland.

As *The Micro User* went to press, Mr. Taylor was writing to all known creditors with a view to holding a creditors' meeting at which he was expected to become their official representative.

Police have asked any readers of *The Micro User* who may be owed money by Mach Technology to contact Mr. Taylor at the above address.

Despite lengthy attempts, no-one from Mach Technology could be contacted to comment on the current situation.

New add-ons for A3000

AS Acorn's A3000 grows in popularity, Pres (0276 72046) has added to its range of peripherals for the new machine.

Its system housing costs £69.50 and can be fitted with 5.25in floppy drive at £99.95, 3.5in additional floppy drive at £75 and 20Mb hard disc for £429.50. Also available from Pres are a monitor plinth for £24.95, an expansion card housing for the rear of the machine costing £14.95 and a disc buffer for £48.95.

"Since we started shipping these items, they have been selling extremely well, in line with the general success of the A3000", reported John Huddleston of Pres.

Hackers will be jailed

HACKERS have taken a predictably strong stance over proposed new laws which could lead to stiff jail sentences for computer misuse. Attracting most criticism is a minor offence which could land the fun hacker with up to three months in prison.

Objectors plan to make their views known to Trade and Industry Secretary Nicholas Ridley who has invited public comment on the recent Law Commission report which recommends stiffer penalties for hacking. Despite this, it seems certain that the Government will bring in the new laws as soon as possible.

"The Commission are to be congratulated on an excellent report which sets out clearly the case for new legisation in certain areas", said Mr. Ridley. "I am inclined to accept the Commission's recommendations. The Government consider that legislation should be brought forward when a suitable opportunity arises.

"I should like to take into account the comments of all interested parties on the detailed proposals. We will be contacting individuals and organisations known to be interested but I also want anyone with comments to write to my department as soon as possible".

Principle objections to the Law Lords' proposals are that they are too hard on the

➤

Manchester United up for the Arc

MANCHESTER United – The Official Computer Game is soon to be converted to Archimedes machines by Krisalis Software (0709 372290).

Billed as the most prestigious licence in the history of football simulations, it is in two sections giving players a chance to try the full management game or just take part in the arcade-style action on the field.

Play covers the FA Cup, Littlewoods Cup and League Championship with features including changing difficulty levels, real-time video goal scoring sequence, cup draw with digitised speech and news flashes on screen.

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FEATURES

News - The latest from the Arc world
Under the Lid - a tour of the Arcs' circuit board
Mastering the Wimp (Part 2) - How to program Desktop windows
Assembler Workshop - Debugging etc.
Into the Arc - What are sprites, and how do you use them
Indirection Operators Explained
Technical Queries and expert answers
Postbag - A chance to air your views
Hints and Tips

UTILITIES AND APPLICATIONS

Colour Image Processing - Techniques from Acorn's Roger Wilson
An Extended Sprite Info Utility - Use this program to get full sprite info
An Icon Selector - to add to your own progams
Full-feature Desktop Diary program
Machine Code Single Stepper (Part 2) A very powerful debugger

REVIEWS

Pipedream 3
Clares' Armadeus
Instigator from Dabs Press
MewSoft's Organiser

(RISC User October 1989 issue)

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young hacker who may break into a computer for fun then be landed with a criminal record.

It is also thought they could put an end to help from honest hackers who may find security holes in a computer system and then report it to the right authorities. It is believed by some that more stringent laws could drive hacking underground rather than stop it.

On the other side, many hackers see the proposed laws as the lesser of two evils – the alternative being anti-hacking MP Emma Nicholson who has called for jail terms of up to 10 years. Public opinion is also in favour of stiffer hacking penalties.

Widely covered in the national press, the Law Commission report suggests three new criminal offences to combat hacking and was compiled after a year-long study. It was thought that patching up existing criminal law would not provide adequate deterrents.

First is a basic offence of unauthorised entry into a computer system which will apply to anyone who enters another's computer either for fun or to try and interfere with it.

This will be a summary offence punishable with a maximum of three months imprisonment.

Second comes a more serious offence of unauthorised entry into a computer system with intent to commit or assist in the commission of a serious crime.

This offence would apply, for example, to someone who enters a bank computer with the intention of diverting funds to himself. Maximum penalty for this offence is five years jail.

The third offence is of intentionally altering computer-held data or programs. It covers the use of worms, viruses or logic bombs and will include both attacks on a particular computer and the circulation of infected discs which could alter data. This also carries a maximum penalty of five years jail.

Quiz show for BBC Micro

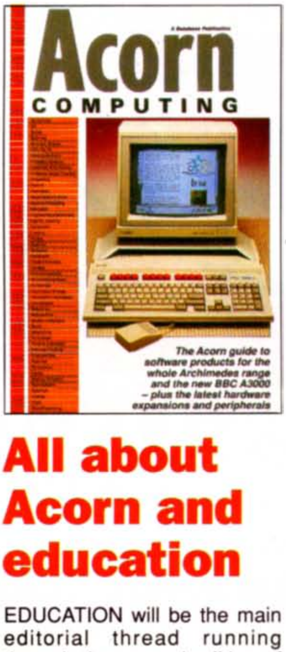
SPORTING
Triangles

A BBC Micro version of TV quiz show Sporting Triangles is due out this month courtesy of CDS Software (0302 321134).

After negotiating the game licence from Central TV, CDS has been producing this popular quiz game across the formats. The BBC Micro disc will cost £14.99.

The next three months will see nine titles out on budget release under the Blue Ribbon label. Games on licence from Superior Software will be sold in packs of three at £2.99. First offering includes Around the World in 80 Screens, Palace of Magic, and Elixir.

Next will be Life of Repton, Spellbinder and Quest then Spycat, Repton thru' Time, and Pipeline.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Acorn
COMPUTING
The Acorn guide to software products for the whole Archimedes range and the new BBC A3000 – plus the latest hardware expansions and peripherals

All about Acorn and education

EDUCATION will be the main editorial thread running through the second edition of *Acorn Computing* to be released at the BETT Show at London's Barbican Centre, from January 17 to 20.

Following the success of the first edition, Database Publications and Acorn Computers will again collaborate to update this official guide of products available for the Archimedes range and the BBC A3000.

The second edition will be bigger, with more catalogue entries reflecting the increase in Archimedes software now available. Of the 20,000 copies to be printed, 10,000 are expected to be distributed free by Acorn at this month's show and will again be available to distributors, dealers and those who inquire about Acorn products.

For those who do not qualify for a free copy, the publication will have a cover price of £2.50 and will available from Database Direct, Ellesmere Port, South Wirral, L65 3EB.

There are also plans for a special Archimedes utilities disc to be offered for sale with the guide. More details of that will appear in February's issue of *The Micro User*.

"For Database Publications, *Acorn Computing* was a good opportunity to produce an Archimedes specific publication in what is a growing market", commented commercial director David Hirst.

"For Acorn it provided a professionally produced catalogue with support editorial to demonstrate tangibly the volume of peripherals and software available for the Archimedes range

"For the public it has provided a unique guide to Archimedes products".

Magnetic attractions

OFFICIAL Secrets (0279 726585), the adventure role-playing club, has now produced solution books for the entire Magnetic Scrolls range of games. These include Jinxter, Corruption and Fish! for Archimedes machines.

Each book covers every part of the game in detail including three-tiered questions and answers, full maps and a code system so individual problems can be solved without spoiling the fun by giving away too much.

Author of Fish! John Molloy has provided the solutions for both Fish! and Corruption, while John Barnsley of Sierra On-Line fame is tackling Jinxter.

The books cost £2.50 to club members.

Barriers coming down

COMPUTER-based communications service MicroLink is poised to welcome its first subscriber from Russia.

Alexander Troukhanov has applied for details from his home in Moscow and the men in the know say there is no reason why he should not be linked up.

This underlines the truly international flavour of the new service provided for MicroLink subscribers.

Once an official ID is allotted, it can be used throughout the world making MicroLink a boon for the busy traveller.

MicroLink users can take advantage of a communications network which services more than 200 metropolitan areas in America, Canada, Mexico, South America, Europe, Africa, Australia and the Asian Pacific rim. It links 20 major industrial countries with more than 175 communications processors and more than 190,000 miles of dedicated terrestrial circuits and satellite links.

Many of the access points now provide 300/300 up to 2400/2400 baud rate service plus MNP Level 5 error and data compression. Before its

➤

No high-spec A3000

ACORN Computers has vehemently denied press rumours that it is to produce a high-spec version of the A3000 at under £1,500.

"I can say unequivocally that this is absolute rubbish. There is no truth in it and Acorn are very annoyed at the suggestion", said Peter Rennison from Hi-Tech PR which represents Acorn.

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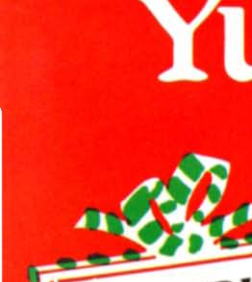

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ACT NOW AND GET YOUR PRESENT FOR CHRISTMAS!

move to the Istel service in October, only three European access points were available to MicroLink.

From his flat in Moscowskaja Street, Moscow, Alexander Troukhanov could soon find himself with a freedom he never dreamed of.

Armadeus price

SOME readers may have misunderstood the price of Armadeus from the review in our November issue. Software costs £79.95 and the sampler board is £149.95. Armadeus comes from Clares Micros (0606 48511).

E-Types lead sales race

ACORN reps have all be given E-Types. No, its not a change to classic company cars but a pat on the back for the Fourth Dimension.

When they go out on the road to demonstrate Acorn hardware, the reps take copies of the E-Type Archimedes racing game with them to show the machine's graphics capabilities. Some of them have also been supplied with Fourth Dimension's Holed Out golf game.

It's open day again

ACORN'S biggest dealer is teaming up with the foremost publisher of Acorn magazines for a special event in January.

When Nazir Jessa of Watford Electronics threw open his doors for an autumn Hands On Open Day in October, 1,200 people turned up. So successful was the event that it is to be repeated on January 28 in conjunction with Database Publications, publishers of *The Micro User*, *Electron User* and the official Archimedes guide *Acorn Computing*.

Leaders in the micro field will be on hand to demonstrate some of their latest products.

They will include Computer Concepts, Colton Software, Minerva and Clares Micro Supplies.

Technical staff from Acorn will answer questions on the whole range of their machines and visitors will be able to discuss Acorn matters with editorial staff of *The Micro User*. Also present will be members of Micronet, plus Archimedes specialists Mike Cook and Gordon Taylor. The open day from 10am to 4pm will also coincide with Watford's post-Christmas sale. Watford Electronics is at Jessa House, 250 Lower High Street, Watford.

Discount on manual

EXISTING owners of Acorn's four volume Programmers Reference Manual are being offered a tidy discount on the new version.

They must rip the front pages off the old manual as proof of ownership and send them with £50 plus £5.20 postage and packing to PRM Upgrade, Vector Services, 13 Dennington Road, Wellingborough, Northants, NN8 2RL. Full price of the new manual is £79.95.

Artisan is upgraded

A NEW version of top selling Archimedes art package Artisan has been launched by Clares Micros (0606 48511). Artisan 2 is a fully Risc OS application which runs in multitasking mode and enables users to load from and save to other multi-tasking applications.

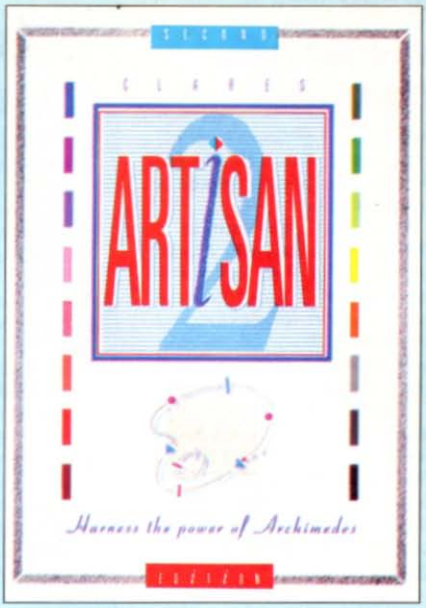
Artisan 2 retains the familiar icon interface of the original and has been developed in line with suggestions from thousands of Artisan users.

"Sticky" menus have been introduced to prevent them disappearing as the pointer leaves the window and a new feature specifically for education is a configure option which allows a teacher to de-select any option in the program.

Every icon and colour can be locked out to enable teachers to concentrate on one aspect of the package when teaching a class.

Pattern treatment is included in Artisan 2 which also comes with a colour separation application called Spot. Artisan 2 costs £59.95 but existing users can upgrade for £30.

Clares has recently reduced the price of its Pro Artisan package from £169.95 to £99.95 and has released Knowledge Organiser, a freeform text database ideal for cross referencing in research. Knowledge Organiser is a successor to Arc TFS and costs £59.95.



Completing Clares' line-up of new products is a Risc OS printer driver for the Hewlett Packard PaintJet. It costs £14.95 or comes free with every PaintJet bought from Clares.

Up front C-Front

MITRE Software (01-283 4646) has produced release 2 of its C-Front package which incorporates support for release 3 of Acorn's Ansi C Compiler.

C-Front includes an easy-to-use front end for the compiler allows users to choose all compiler options needed then compile a file by simply dragging it to the application. It costs £19.95 with free upgrade on return of the release 1 disc.

Tactical war for two

LASER Squad is the latest one or two-player tactical warfare game from Blade Software (0480 496497).

With choice of weapons, battle maps and an artificially intelligent one-player option it has been written by creator of Rebelstar and Chaos Julian Gollop.

An Archimedes version, due soon, will cost £29.95.

LASER SQUAD

New version C compiler

RELEASE 3 of Acorn's Ansi C compiler for Risc OS and the Archimedes range of micros is now available.

New features include a library of routines which puts the power of Risc OS at the disposal of C programmers plus support for developing desktop applications, relocatable modules and programs using overlays.

Enhanced development tools include ASD, a source level debugger now with low level capability, AMU, an upgrade of the Acorn make utility and Squeeze, a utility for compacting executable programs.

Release 3 comes with a 500 page manual and four reference cards. Full price is £171, but existing owners of Release 1 can upgrade for £70 and Release 2 for £50. An additional charge of £5.20 is made for postage and packing.

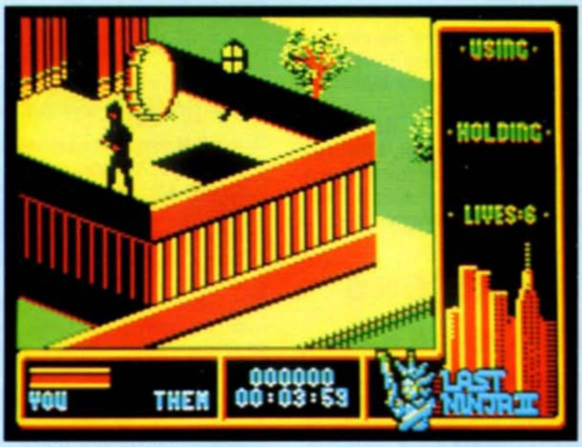
Payment must be sent with the original disc to Vector Services, 13 Dennington Road, Wellingborough, Northants NN8 2RL.

Last Ninja milestone

SUPERIOR Software (0652 58585) has chosen a new version of an all-time favourite to mark a milestone in its six year history. For its hundredth release, Superior has chosen Last Ninja II based on the company's best-selling game of 1988, The Last Ninja.

"The Last Ninja is now up to 20,000 sales", said Superior's Steve Hanson. "The great popularity of the original games is one of the main reasons why we have decided to bring out this new version".

With Last Ninja II, the action moves from Japan to the streets of downtown Manhattan. There are more baddies to fight and Peter Scott's new scenario allows for more colour and better graphics than the original Ninja. Price £11.95 for 5.25in disc, £14.95 for Master Compact 3.5in disc and £9.95 for tape.



Last Ninja in Manhattan

Latest news on the Play It Again Sam front is that number 12 will include boxing simulation By Fair Means or Foul and a prize winning game from the Repton Infinity competition.

Games for handicapped

ALAN Weatherill of Scarborough (0723 361409) has produced nine BBC micro games specifically designed for mentally or multiply handicapped adults.

The programs have been designed to repeat themselves and to adapt to the user's skills but the main aim is to provide fun.

"I believe handicapped people could benefit much more from computers, not just through education but also from sheer enjoyment", said Alan, who produced the games using the Arcade Game Creator featured in *The Micro User* and *Electron User* magazines. "These games were produced for one man I know who was only able to carry out limited shape matching activities with wooden pieces until he began using a computer.

He now has a battery of converted software including my programs which encourage concentration, directional control skills, planning ability and differentiation skills.

"I am willing to give the games to anyone who is interested and has special needs".

Painter produces lines of colour on the screen with direction and colour being changed by simple switch instructions.

Gates requires the player to guide a wheelchair user towards a key and pick it up.

Maze features a wheelchair user being guided towards a house and avoiding red squares with increasingly difficult screens.

Fill is similar to Maze but each square passed over turns red.

Bomber centres on a plane bombing skyscrapers and Snap provides sound rewards when pictures are matched using the space bar or switch.

Match is a more involved version of Snap featuring shape recognition with two options and Memory is a further advancement with four options shown on screen after the initial shape. Hunter fills the screen with pigs and frogs. Switch presses move a man around so he can collect them.

When the screen is clear there is a visual and audible reward. Recently added to the collection is a seasonal game called Santa.

Gold-plated deal

WHEN dealer Jim Golightly sold 500 A3000s to Durham Local Education Authority he won himself an Acorn Gold Plate Award for the largest single order of the new machine. Managing director of Newcastle-based HCCS, Jim was one of three men to receive awards at the latest of Acorn's Premier Dealer League dinners held at London's Kensington Park Hotel. Scooping a prize for the most innovative application of an Archimedes computer was Barry Copeland, whose company B&S Computing developed a program for a customer who supplies seat embroidery to the Ford Motor Company

The design, and any necessary adjustments to seat covers are made on screen and then the Archimedes computer is linked to the loom which weaves the fabric.

Third award for the best promotional effort went to Chris Carne of Surrey-based Calancraft. Presentations were made by Acorn's commercial director Sam Wauchope.

Archie help for Andy

VIEWERS who tune into childrens' programmes on BBC 1 are being treated to new animations and music courtesy of an Archimedes 440/1 and software from Cheshire-based Clares Micro Supplies.

Dave Clare was called in when BBC producers decided to beef up links for the childrens slot which is introduced by TV personality Andy Crane. He went to London to show them the capabilties of Pro Artisan, Render Bender and Armadeus.

Impressed, they used Pro Artisan to produce the graphics, animated them with the Delta Animator then added the sound with Clare's sound sampling package Armadeus.

Simulations to cost more

RBRC Software (01-946 8641) is to put up the price of its business simulation software from this month.

"This is our first ever price increase but all orders received before January 1 will be invoiced at the current lower prices", said Professor Ronald Brech of RBRC. "All packages sold at the new higher prices will contain a 10 per cent discount voucher on the next purchase of any RBRC software".

Beat the Boss, The Cement Business Game, Handling Time and Buy 'em Down will each cost £46 plus £3 postage and packing from January 1. Crisis Management will become £65 plus £5 and Don't Panic will cost £32.77 plus £2.50.

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420/1	198.85	195.00
420/1 Colour	218.20	217.00
440/1	290.85	287.00
440/1 Colour	310.20	309.00

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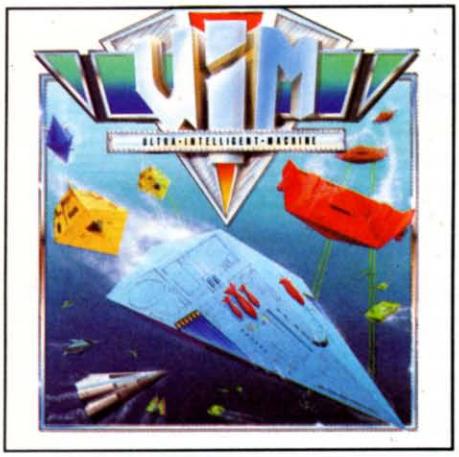


U.I.M.

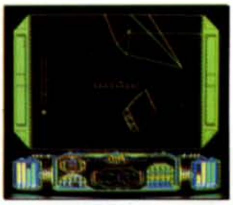
U.I.M. is a massive 3D arcade adventure set in the future. 2 ½ years of dedicated design and programming have produced this massive game.The "greenhouse" gases melted the icecaps and all life now exists in the oceans. There are over 65000 underwater ports each with their own colonies.

You must travel the oceans, trading in commodities, shares and currency. There are over 250 missions to complete before you will find your goal - the U.I.M. - created to be almost a god! Your craft is a highly manoeuvrable (and expandable) futuristic submarine named Black Satyr.

On your travels you will encounter many submarine types. Many of the most advanced and aggressive submarines do not appear until you reach later networks of ports. In addition you will also meet the Replicants - man-made underwater machines which have gone "renegade" and are capable of reproduction.

As you progress it is therefore essential to avail yourself of the highly sophisticated range of combat and defensive equipment available. The quest for the U.I.M. will be long and involved, the dangers intense, but the reward priceless!

U.I.M. is disc only and will run on BBC B or B+ with 16K of sideways RAM, BBC Master series and all Archimedes Computers.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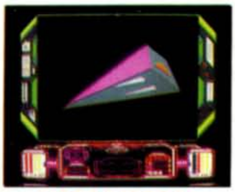
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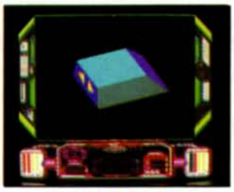
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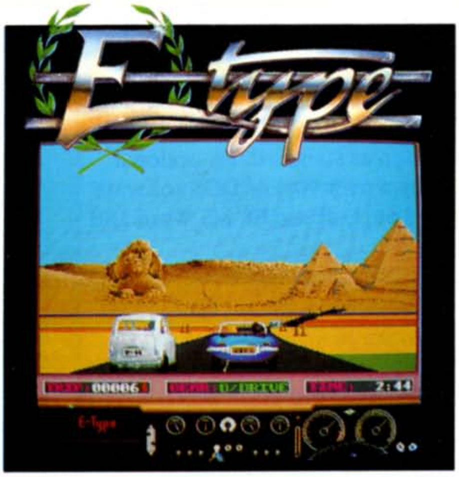

E-TYPE

Take control of £70,000's worth of gleaming "E-Type" and head off for the drive of a lifetime. Hear the digitised roar of the 5.3 litre 12 cylinder engine as you tear along lanes, motorways and desert tracks at over 150 mph.

"E-Type" takes racing simulations into the world of 32 - bit RISC processing and gives you smoother, faster and more detailed graphics than you are even likely to see in the arcades.

If you're new to driving you can take the easy-to-drive automatic for a spin but experienced drivers can optimise their performance in the faster 5 speed manual "E-Type". There are hazards galore including other cars, roadworks, trees, rocks, bushes, billboards oilspills, etc. etc.

"E-Type" has been produced by the highly acclaimed and experienced Gordon Key who also produced the best-seller Holed Out.

E-Type Designer

Design your own "E-Type" tracks with this highly advanced but simple to use designer. It is enormously flexible to produce an endless variety of tracks to challenge you and your friends. (N.B. You need the original E-Type in order to use this designer).

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WHITE MAGIC

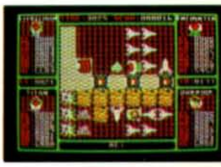
White Magic is a unique arcade adventure in which you control 4 varied adventures:-

Kaldor the Leprechaun, Cheysul the Titan, Moriana The Warrior and Mandrake the Enchanter.

You can transform between all 4 characters at will and use their much needed special abilities.

It features 32 massive action-packed levels filled with aggressive guards and trolls, haunting ghosts and spectres, curious objects to find and use, and much more .....

White Magic is not a game for the faint-hearted; it is a fast-action game which requires fierce hand - to - hand combat and frantic weapon fire.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The Fourth Dimension

PRICES AND AVAILABILITY	ARCHIMEDES 31/2" DISC	BBC B/MASTER 51/4" DISC	BBC AND ELECTRON CASSETTE	MASTER COMPACT 31/2" DISC
U.I.M.	29.95*	19.95	-	21.95
E-Type	19.95	-	-	-
E-Type Designer	16.95	-	-	-
The Olympics (6 Events)	19.95*	-	-	-
White Magic	19.95	12.95	9.95	13.95
White Magic 2	19.95	12.95	9.95	13.95
Holed Out	19.95	14.95	12.95	15.95
Holed Out Extra Courses 1	16.95	11.95	9.95	12.95
Holed Out Extra Courses 2	16.95	11.95	9.95	12.95
Holed Out Designer	19.95	-	-	-
Arcade Soccer	19.95	12.95	9.95	13.95

*The Olympics and U.I.M. Archimedes versions due for release 5th December, 1989.

DIMENSION

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WHITE MAGIC 2

This includes 32 brand new and highly dangerous levels plus a complete level designer.

The level designer is a doddle to use and can be used to alter or design levels from scratch.

An extra invisible feature in White Magic 2 will really confuse our adventurers!

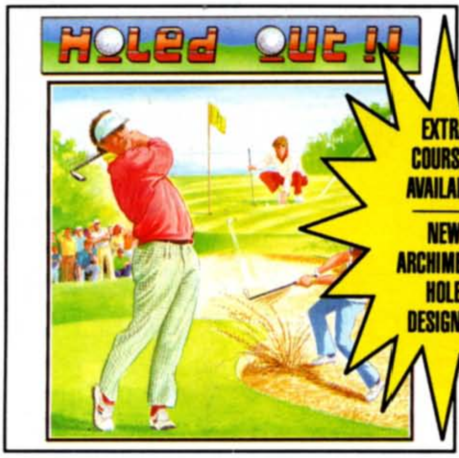
Reviews of White Magic

"The graphics are superb .... An absolute winner"
Electron User Golden Game August '89.

"Playability is good and I had to tear myself away in order to write this update review."
Archie review - The Micro User, October 1989.

ELECTRON

ARCHIMEDES



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"I play golf and this game is the closest thing I've seen to the real game on a computer".
Archive, June 1989

"I wouldn't have thought it possible to get a better simulation out of the beeb".
BBC Acorn User, June 1989

"The 3D perspective graphics are stunning". *Electron User GOLDEN GAME June 1989*

"Holed Out is great ..... The game plays very well and the graphics are superb".
Popular Computing Weekly. March 1989

"The Electron version is brilliant - it's almost the same as playing at Gleneagles. Unreservedly recommended". *A & B Computing Game of the Month, June 1989*

HOLED OUT EXTRA COURSES

In response to your many requests we have now produced 2 volumes of extra courses. Each volume contains 2 superbly designed brand new courses plus the original Holed Out program; therefore you do not need the original Holed Out to play them. Each course has been meticulously created to test your golfing abilities to the limits. The holes are very varied and even Nick Faldo would need to use his skills to keep up his recent record.

ARCHIMEDES HOLE DESIGNER

Create your own golf courses with this easy - to - use yet highly sophisticated hole designer. Its flexibility allows you to define all aspects of the holes from their pars to the position and size of the lakes. It will keep you enthralled for years.

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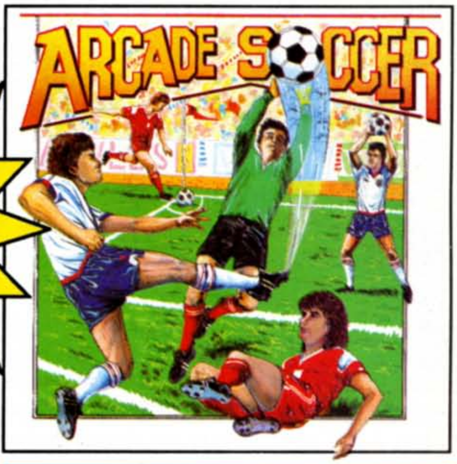

ARCADE SOCCER

Arcade Soccer really is football action at its very best.

Using an overhead view to make game play as exciting as possible it features everything that you could want in a football game. Corners, sliding tackles, throw-ins, goal kicks, dribbling, shooting, passing and much more. But not only does Arcade Soccer give you Total Action it also puts you in Total Control.

Firstly you can play with either keyboard or joysticks, against the computer and/or with up to 23 friends. The options are almost limitless; you can choose the skill of the goalkeepers, the speed and length of the game, play "friendlies" or tournaments and even enter the most coveted of championships - the World Cup.

"The game is very playable and you do get a feeling of involvement as you knock the ball into the corner of the net straight past the diving goalie. It's definitely one to play again, and if you've enough friends it could make for a good day of enjoyment - and not a lot of games can do that. Value for money ... 10 out of 10".
The Micro User, October '89.

ARCADE SOCCER
The Fourth Dimension
©1989

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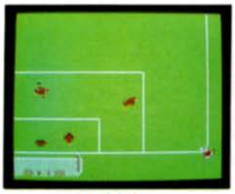

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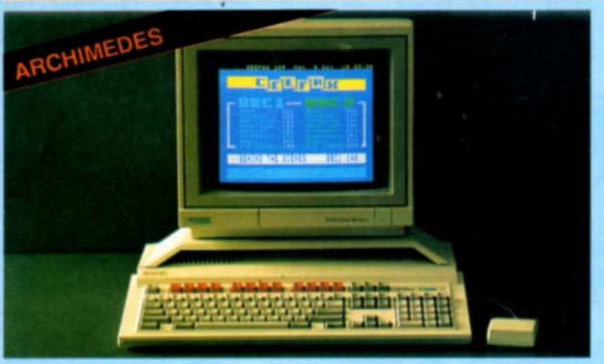

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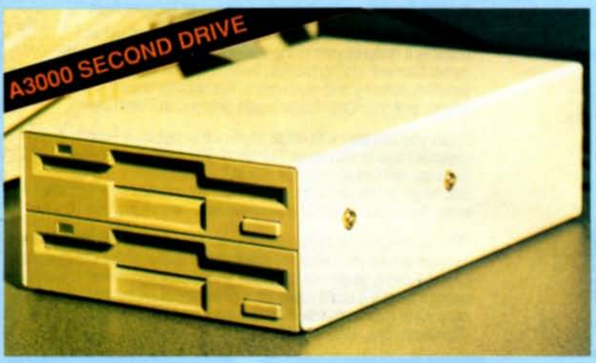

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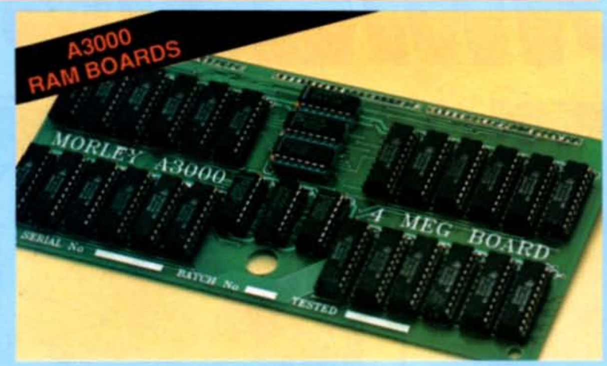

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Acorn PC Emulator	£99	Clares Toolkit +	£43

We are now an Acorn dealer and service centre. If you would like to have a look at the A3000 or any other Acorn/Morley products please feel free to call in and discuss your requirements with our staff.

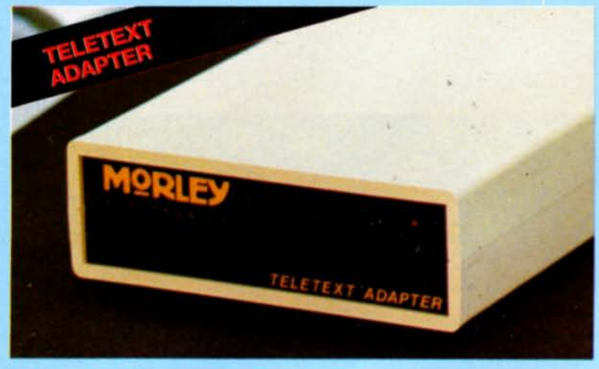
The Morley TELETEXT ADAPTER is now available for the Archimedes. The specification including screen dumps etc., is the same as the BBC version but connection is via a Podule socket.

£125

EXISTING USERS OF OUR BBC TELETEXT ADAPTER WE CAN UPGRADE THE UNIT FOR THE ARCHIMEDES FOR £35

RING FOR DETAILS

MORLEY ELECTRONICS



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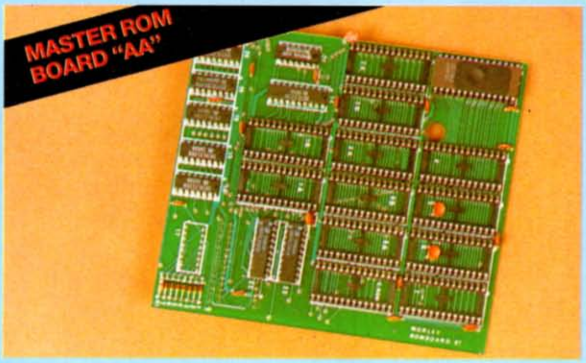

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SMART CARTRIDGE
WARNING
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MORLEY ELECTRONICS

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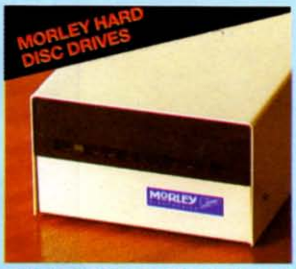

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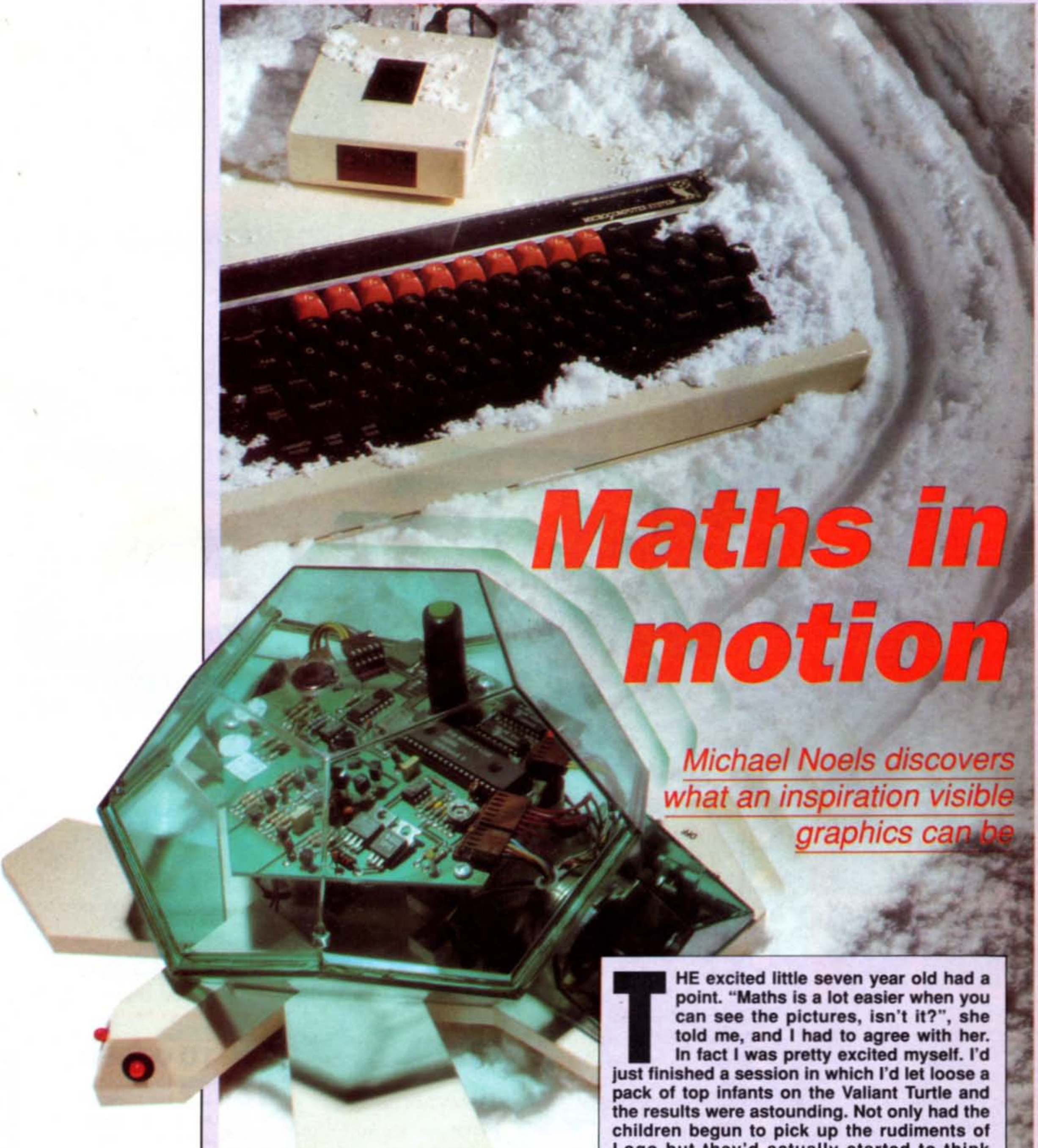


Maths in motion

Michael Noels discovers what an inspiration visible graphics can be

THE excited little seven year old had a point. "Maths is a lot easier when you can see the pictures, isn't it?", she told me, and I had to agree with her. In fact I was pretty excited myself. I'd just finished a session in which I'd let loose a pack of top infants on the Valiant Turtle and the results were astounding. Not only had the children begun to pick up the rudiments of Logo but they'd actually started to think mathematically as well. And the proof was there for all to see...

But first things first, this enthusiastic start wouldn't have been possible if it weren't for Logo. Logo is a full programming language and as such supports variables, repetitions, conditional statements and so on. In fact it's not too far outside the mainstream of languages and is fairly easy to pick up if you already know how to program.

However Logo is best known for its visual *front end*: Turtle graphics. You steer a cursor – or turtle – about the screen using a series of easily assimilated commands. As you tell it to go forward, back, left and right it trails a line behind it. From these simple elements complex geometric structures can be built up allowing you, as my young friend put it, to see mathematics in action.

Now I'd used turtle graphics with children before, but never found it to be the mathematical nirvana described by Logo's more fervent adherents. Interesting and useful certainly, but not worth more than a paragraph if you're writing home. However the turtle graphics screen is one level of abstraction away from a more practical and exciting application – that of controlling an actual robot, or turtle, designed to crawl around the floor in response to the usual graphics commands.

As often is the case with basic mathematics teaching, getting down to the concrete is the quickest way to the abstract. In this instance the concrete lies on the floor. The turtle I used was the little beast from Valiant – and a very friendly creature it is. Despite being made mostly of pentagonal pieces of plastic, it really does resemble a turtle, albeit a high-tech one.

Occupying an overall area of around 25 x 25 cm, it scampers round on two stepper motors buried in its rear legs, a third point of balance being a spherical bearing under its nose. The turtle also has a fibre tip pen buried in its navel. Lowered and raised by PENDOWN and PENUP respectively, the pen can trace the route the turtle follows – giving a graphic record of the journeys you've programmed.

The turtle is powered by on-board rechargeable batteries – the power unit supplied lets you top them up in situ. Control from your BBC Micro is via an infra-red communicator, a flat plastic box with a transparent red window for infra-red signals. Using the same power supply as for battery charging, it connects with the BBC Micro via both the user and serial ports.

In the classroom I was using Logotron Logo – my LEA's preferred brand – but the system can be configured for other versions, including LSL Logo. The only really user-critical operation is plugging everything in initially. After that, bringing the turtle to life is simply a matter of entering Logo with:

```
*LOGO
```

and, after inserting the interface software disc, typing:

```
USE "VALIANT
```

or whatever the relevant filename is for your Logo. This adds some extra commands to Logo: Basically you can choose whether to have the screen and/or floor turtles moving in response to FORWARD, and also alter the size of the turtle's steps.

Alternatively you can use the Mover program supplied on disc. This bypasses Logo: You just boot it up and it converts input such as FORWARD (FD), BACK (BK), RIGHT (RT), LEFT (LT), PENUP (PU) and PENDOWN (PD) commands into turtle speak. It incorporates an editor even its mother would have to admit is rather primitive.

Eventually I preferred to go through Logo – as the full scope of the language is then available. Whichever software route you choose, you can make the floor turtle respond to commands in the same way the screen turtle does. Put like that it doesn't sound much. Wait until you see it literally animate a maths lesson, though.

Training the trainers

Giving the children Terry – as the turtle was soon christened – seemed to take their whole problem-solving stratagems up a gear. They were hypothesising, experimenting, re-evaluating and theorising away enough to please even the most ardent logophile. More importantly, the turtle trainers themselves were learning ... and liking it.

Terry soon became the focus of myriad learning activities from simple shapes to shortest routes, from patterns to puzzles, from mazes to areas. Turtles are very mathematical beasts.

To sum up, Logo definitely has value in the classroom. However, to see it at its full potential in the younger age groups it really helps to have a turtle. Even when children have graduated from floor turtle to screen turtle they like to come back to it to check things out in reality.

Valiant's turtle makes all this simplicity itself. Straightforward to set up it's reliable and user-friendly. While not cheap, it's certainly worthwhile. If you can, get hold of one for your classroom.

The system

Turtle (special price for schools)
£249.00
Valiant Technology,
Gulf House, 370 Old York Road,
Wandsworth, London
SW18 1SP.
Tel: 01-874 8747

Logo
£44 (BBC), £60 (Archimedes)
Logotron, Dales Brewery, Gwydir Street, Cambridge CB1 2LJ
Tel: 0223 323656

Turtle troubles

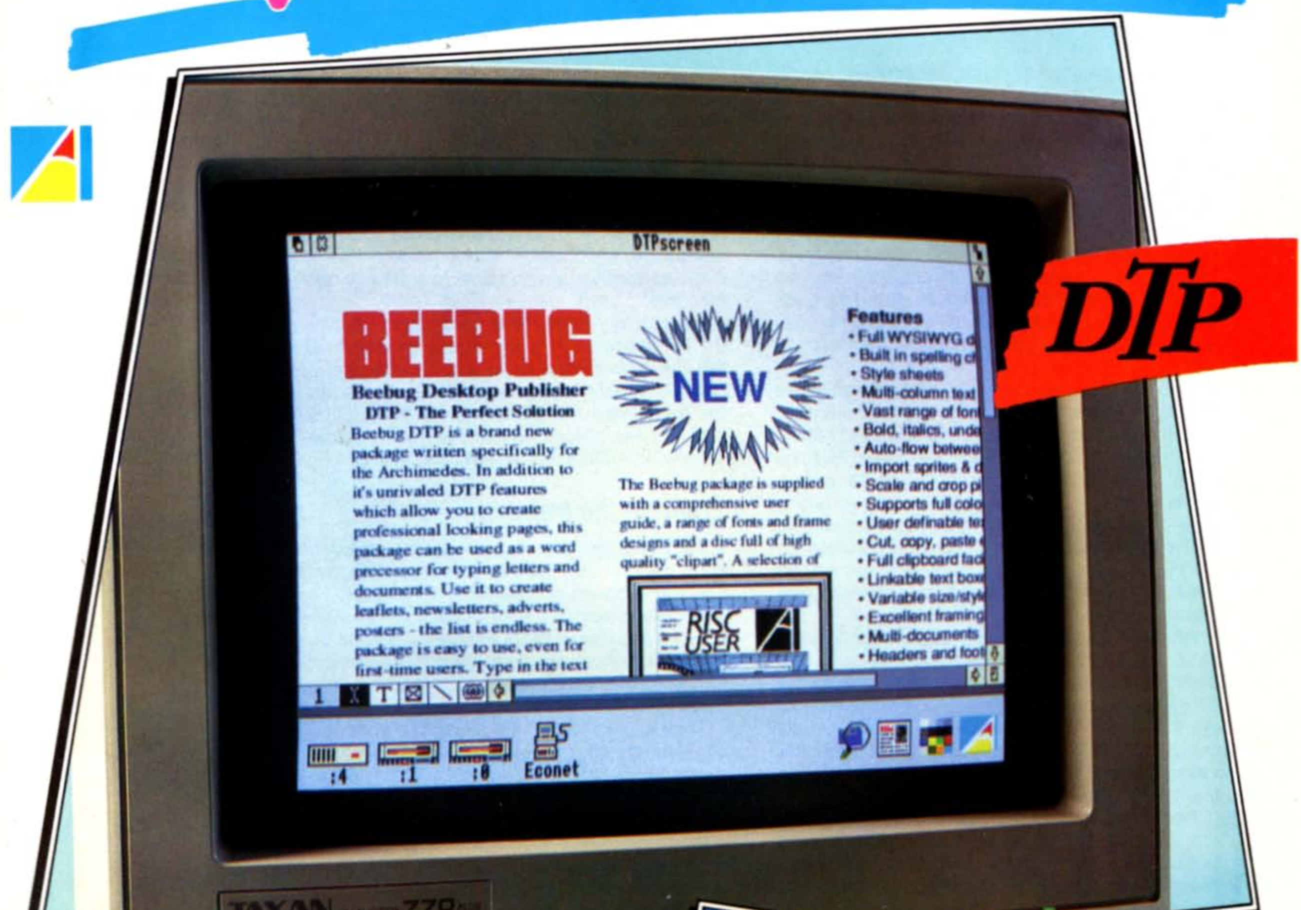
OCCASIONALLY when we tried to get going nothing happened – the turtle failed to sync. Sometimes this was because the batteries needed a topping up – though one charge gives a continuous three hours of running, plenty for a normal school day. More often than not it was our infra-red link on the blink.

Normally it was simple problem of range – we tended to get the turtle too close to the communicator rather than too distant – though sometimes strong sunlight can scramble communications.

Overall, though, the system was reliable and resilient and performed to well within the accuracy range we needed. There's no need for technical wizardry here – if you can put a plug on you can use the Valiant Turtle.

In fact, apart from actually connecting the communicator to the micro I found that my charges could easily handle the start-up procedure themselves and soon had the turtle trundling around the floor.

Visualise & realise,



DTPscreen

BEEBUG

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Beebug DTP is a brand new package written specifically for the Archimedes. In addition to it's unrivaled DTP features which allow you to create professional looking pages, this package can be used as a word processor for typing letters and documents. Use it to create leaflets, newsletters, adverts, posters - the list is endless. The package is easy to use, even for first-time users. Type in the text

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- User definable te
- Cut, copy, paste
- Full clipboard fac
- Linkable text box
- Variable size/styl
- Excellent framing
- Multi-documents
- Headers and foot

:4 :1 :0 Econet

Scavenger

Professional 400 DPI Scanner

The Beebug Scavenger hand-held image scanner for the Archimedes adds life to DTP, Word Processing, Drawing and Painting, by enabling the incorporation of photographs and drawings into documents. The 105mm wide scanner features **true** 400 DPI resolution unlike most other hand-scanners currently available, where the 400 DPI is hardware generated from 200 DPI.

As you scan, the WIMP-based software supplied on the podule, displays images on the screen in real-time. Once scanned, these images can be cropped, scaled, flipped, converted into grey shades (to enhance photographs), transferred directly into other RISC OS applications such as DPT, ArcPaint and ArcDraw, or saved in a special compressed format to make the best use of disc space.

The package includes Scanner, half-width podule, built-in ROM software and a comprehensive user guide.

Price £173.04 + VAT + £7 Carriage

SCAVENGER A4

A full A4 width 200 DPI scanner is also available with half-width podule, built-in ROM software and user guide.

Price £346.96 + VAT + £7 Carriage

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DTP + Scavenger, HARD DISC *Companion + Hearsay,* NOW *from BEEBUG*

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Beebug DTP is a brand new package written specifically for the Archimedes. It has unrivalled DTP features which allow creation of professional looking pages for leaflets, newsletters, adverts, posters or use it as a word processor for typing letters and documents. The package is easy to operate, even for first-time users. Type in the text, specify the font, style and size, add headlines, import and scale pictures, move items to their final positions; the page you are creating is shown on the screen exactly as it will look when printed.

The Beebug DTP package is supplied with a comprehensive user guide, a selection of example documents, a range of fonts and frame designs, and a disc full of high quality 'clipart'.

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- Scale and crop pictures
- Supports full colours
- User definable text styles
- Cut, copy, paste etc.
- Full clipboard facilities
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Available late 1989. Please write or phone for specification.

HARD DISC *Companion*

Essential Hard Disc Utilities

Hard Disc Companion contains an easy-to-use and reliable **'Backup'** facility which allows the contents of the hard disc or network to be saved onto floppy discs. Two types of backup are possible; **'Full'** saves every file on the hard disc to floppy, whilst **'Incremental'** saves only those files added or changed since the last backup. **'Restore'** is equally comprehensive allowing full, partial, or file-by-file restore from floppy disc. Hard Disc Companion also contains **'Spark'**, a file compressor and archiver, and **'Find File'**, a fast easy-to-use utility for locating files on disc or network.

Price £33.91 + VAT + £2 Carriage

Hearsay

The Definitive Communications Package

This exciting mouse-driven package takes communications on the Archimedes into a new league. It is ideal for use with Prestel, Telecom Gold and bulletin boards, and no technical knowledge is necessary. **'Hearsay'** provides extensive emulations of all the terminals you should ever need, including: VT220, VT102, Prestel, Tektronix and TTNS. File transfer protocols provided include: XMODEM, YMODEM, SeaLink, Kermit and ASCII. Other features include: telephone directory, call logger, capture buffer, viewdata editor, and line editor. **'Hearsay'** works with virtually all modems including Hayes and DTI. Modem leads are available for most makes of modems – please phone for details.

Price £60 + VAT + £3 Carriage

All details within this advertisement are subject to alteration due to continuing development and improvements.

All products require RISC OS and at least 1 MByte of RAM.

Beebug Limited BEEBUG

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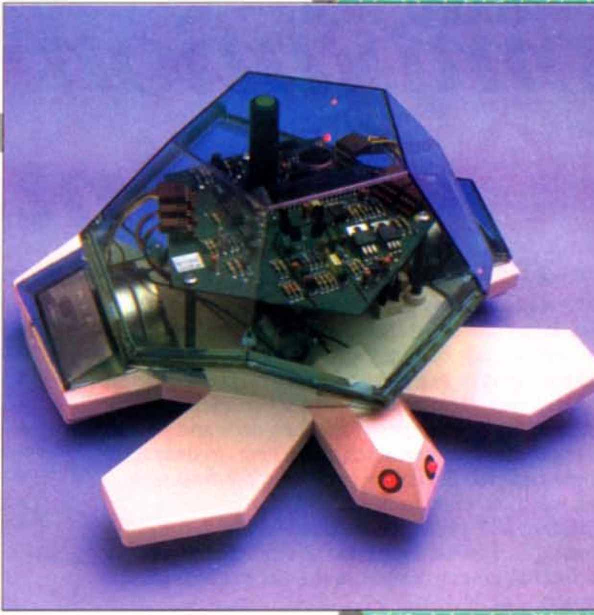
(0727) 40303 FAX (0727) 60263

VALIANT



THE VALIANT TURTLE

Designed in 1983 to be accurate and safe, the remote-controlled VALIANT TURTLE has passed brilliantly the test of time. Approved and purchased in large numbers by most UK LEAs, Turtles are the key to mathematics, computing, problem-solving and programming in primary and secondary schools. They unlock understanding of abstract ideas through the computer language which controls them, Logo.

The Valiant is known for its distinctive, turtle- like shape and precise performance. As this Turtle glides around the classroom floor in response to children's commands, geometry becomes an unforgettable, exciting experience.

Valiant Turtles run from Acorn, Apple, Commodore, IBM, Research Machines and ZX Spectrum computers. Their discounted UK education price is £259 (+£5 P&P + VAT). Like all Valiant products they come with a 12-month warranty.

NEW PRODUCTS FOR THE 1990's

THE VALIANT CONTROL CONSOLE

The newest Valiant product will appeal especially to secondary level pupils. Developed to replace the use of a computer and buffer box in Design and Technology, Mathematics and Science, the VALIANT CONTROL CONSOLE provides power at low cost. Technology is a vital skill in contemporary life and building working models has become a fundamental school exercise. Driving them from the Control Console is effective and economic.

The discounted UK education price of the Valiant Control Console is £150 (+ £5 P&P + VAT).

THE VALIANT ROAMER

Originally inspired by the toy Big Trak, the VALIANT ROAMER creates its own learning environment. In its basic form it is a "pre-Turtle" programmable device, free of the computer and particularly suitable for young children and those with learning difficulties. Roamer is controlled from its own keyboard using Logo-like instructions. It will move, turn and make sounds.

Adding Accessories transforms Roamer into a new, powerful tool for Design and Technology. Designing, building and operating their own robotic creations from the Roamer keypad presents students with a goal and the means to achieve it, an important part of today's syllabus.

The discounted UK education price of the Valiant Roamer is £69.95 (+ £5 P&P + VAT). Roamer Accessory Packs start at £14.95 (+ P&P + VAT).

For more details please contact:

VALIANT TECHNOLOGY LTD
Gulf House, 370 Old York Road, Wandsworth,
London SW18 1SP, England.
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TECHNOLOGY FOR EDUCATION

UPDATE

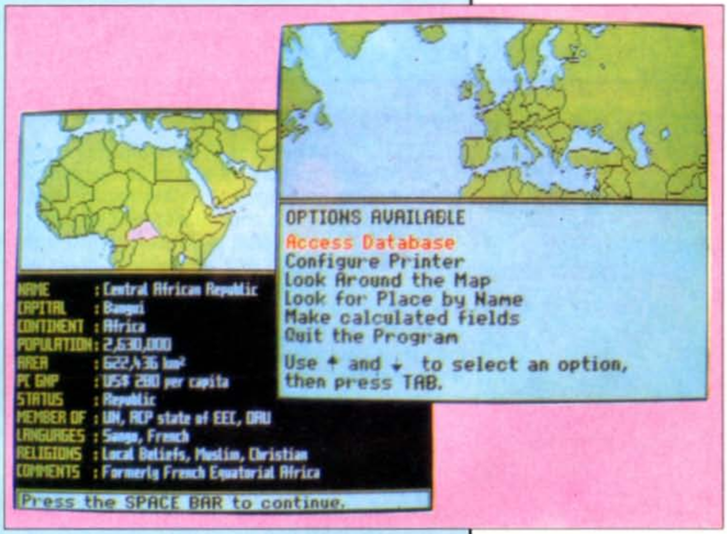
World database

WINDOW on the World is a new classroom tool from Surrey-based Oriel Software.

It's an interactive database of every country and independent state in the world with information including capital city, population, gross national product, religions, political status and languages. Each field can be updated by the teacher and calculations with different fields can be made on screen. For example, population density can be worked out by dividing population by the area.

Another interesting feature is a scrolling map of the world over three times the full screen size. Pupils can move around the map and select countries for information. Alternatively, they can type in the name of the country and the program will scroll to the appropriate point.

Oriel has developed the program to help in teaching geography, politics, history, languages and religious studies. It runs on the Master 128 and Compact and costs £95. Oriel is based at 5 Weycroft, Portmore Park Road, Weybridge, Surrey KT13 8HH.



```
Use ↑ and ↓ to select an option,
then press TAB.
```

```
NAME        : Central African Republic
CAPITAL     : Bangui
CONTINENT   : Africa
POPULATION  : 2,630,000
AREA        : 622,436 km²
PC GNP      : US$ 280 per capita
STATUS      : Republic
MEMBER OF   : UN, ACP state of EEC, OAU
LANGUAGES   : Sango, French
RELIGIONS   : Local Beliefs, Muslim, Christian
COMMENTS    : Formerly French Equatorial Africa
Press the SPACE BAR to continue.
```

Window on the world from Oriel Software

Logotron taken over

THE education division of software house Logotron has been sold to the Longman Group. It is claimed the deal will create the largest educational software operation in Britain.

To be called Longman-Logotron, the new company will combine Longman's extensive school software list with Logotron's own product range.

A different sort of menu

A RECENTLY launched educational program is truly menu-driven. Written for use in domestic science classes, Food Analysis is the latest offering from W.L.Computer Services (051-426 9660).

It summarises the total energy, protein, fat, calcium, irons, vitamins and other contents of a large range of foods and allows users to produce totals of these for meals according to the weight of each food used.

Information on the dietary composition of more than 200 common foods is available in an easily accessible form which can be called in and displayed as a food-by-food breakdown plus a summary totalling the information for up to 15 foods at one time. It will also print out the recommended daily intake of these foods for men and women.

The supplied disc for BBC Micros holds three food analysis programs, one for those with shadow memory using 307 different foods including fibre and two for the BBC Model B giving 221 foods with fibre or 241 without. It also contains two data files for these programs so the user can alter the data to include food of his own choice.

Price £10.35.

Accent on the environment

GREEN issues are emphasised in the two latest packages from Scetlander (041-357 1659). In Leisure Complex, children adopt the role of property developers. They have planning permission to develop an attractive rural site into a leisure park with a hotel and chalets as well as creating various indoor and outdoor activities. Pupils have to cope with many real-life problems such as drainage, waste disposal and water supplies.

They can also risk upsetting the local community and destroying the indigenous wildlife to make a quick profit but must take into account what the long term effects of this could be. Using local authority and conservation reports, children are encouraged to reach environmentally sound but commercially realistic solutions. Enough material is included to make it the basis of a term long project. Price £17.25.

With Snapshot, the second Scetlander product, children assume the role of wildlife photographers. They are given permission to visit a

➤

➤

large country estate where they can practise their photographic skills but first they must find the animals.

Careful study and interpretation of the local newspapers – a four page, full colour tabloid is supplied – and close attention to the way in which animals depend on and interact with their environments are taken into account. The intrepid photographers must follow the country code at all times. Snapshot costs £17.25.

THE
MICRO
BUGS

Microbugs take to the networks

SHERSTON Software (0666 840433) has produced network versions of two of its latest and most popular packages, The Microbugs and Mapventure. This is a continuation of Sherston's commitment to networks in schools which has already led to Econet and SJ versions of six of its educational adventures.

Mapventure is a simulation for nine to 14-year-olds. The first part teaches children all the map skills necessary to complete part two which is like orienteering on a computer.

The Microbugs is an information technology adventure for the same age group. It starts when a micro mysteriously breaks down. Microbugs are blamed and the children are invited to enter the computer to try and catch them. Using circuit diagrams supplied, they have to chase the bugs and repair the damaged chips in an intriguing adventure.

Mapventure for the network costs £52.44 and The Microbugs £63.25.

Educational software on top

THE sixth edition of the Datafile of Educational Software and Addresses has now been published. It includes 4,370 records of software titles and more than 1,000 addresses of agencies likely to be of interest to the educational computer user. There are now Key and Viewstore versions for the BBC Micro series including the Archimedes.

The datafile of both software and addresses costs £20. Bought individually they each cost £12 from Nick Evans Datafiles, PO Box 55, Grimsby DN32 0QB, Tel: 0472 77215.

Maths pack for youngsters

MATHS Pack 1 from H.S.Software (0792 204519) for five to seven-year-olds keeps detailed records of children's scores so a comprehensive check can be kept on individual progress.

Designed in line with the National Curriculum, it has a wide range of maths-based games which can be adjusted to meet the ability levels of all children. They include matching, counting and number sequencing activities.

Maths Pack 1 also features a disc record of pupils successes and errors for every game played offering up to 45 tries at each of a combinations of 36 different games. The disc can hold data for up to 36 children. A graph of individual scores and a summary of all scores can be displayed on screen.

Maths Pack 1 is available on disc for BBC Micros and costs £9.95 on special introductory offer, £11.95 from March.

Package covers digital designing

The latest LogicWorks package is claimed to be the first software program designed to meet the needs of digital electronics instruction. It aims to cover every level of the electronics curriculum from logic gates to functional logic design.

Mainstay of this package from CADsoft Systems (09323 42137) is the ability to build a diagram of a live circuit on screen, backed up by digital simulation

It is designed for self instruction in the laboratory environment and has an intuitive, responsive interface which allows students to explore with little reference to the user manual. Since LogicWorks allows design errors to be detected before they are breadboarded, it reduces the lab resources normally needed for an electronics program.

LogicWorks will run on an Archimedes machine, A3000 upwards and costs £224.

Christian quiz

EDUCATIONAL Software writer John Lyons has followed up his programs for hairdressing and catering students by filling what he considers is another gap in the educational computing field – religious education.

His latest offering is Multiple Choice Quiz for Christians which includes 120 questions mainly on the New Testament. Designed for use on BBC Micros, the package costs £9.95 and has been developed for both open and closed learning situations. John Lyons Educational Software can be contacted on 0276 65275.

Fight fire on your micro

THE Firewise Pack, a new Home Office approach to fire safety education for nine to 13-year-olds, is being provided free to schools. It includes a database on a BBC Micro disc with facts and figures plus details of 240 mainly domestic fires, nine project sheets and a map of a fictitional town.

The pack was produced with the help of Bedfordshire Fire Service, the local education authority and junior schools. It puts pupils in an artificial environment created through the database and map of a fictitional town. They are given various different fire scenarios then use the friendly software to fill in reports showing their awareness of the causes, dangers and potential results of fire.

Both the disc and project sheets are free to be copied. The pack is available from COI Stores, 184 Shepherds Bush Road, London W6 7MP.

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NUMERATOR is a highly visual mathematical construction kit which can be used with pupils of all ages and levels of ability. To help you explore the full potential of Numerator as a learning aid, we have produced the **NUMERATOR CHAOS PACK.**

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We will be demonstrating the Numerator Chaos Pack at the show. In addition, a limited number of packs will be on sale at our stand.

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BETT 1990
17TH - 20TH JANUARY

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Stand R6C

Stop Press..!! Longman Logotron announce Pendown for the Archimedes/A3000
(provisionally scheduled mid 1990)

PRINTBOX is Longman Logotron's latest product for BBC "B" and Master computers. It is a child-centred page design program which allows even the youngest children to mix text and pictures on the screen and on the page to create anything from greeting cards to newsletters.

PRINTBOX

One of the most versatile features of Printbox is that it works with other programs. Its 'grab' facility lets you cut text or graphics from other programs and paste them into your Printbox document. This powerful feature will allow children to present work from most packages which run on the BBC.

Come and see Printbox in action at the show. Copies of this program will be on sale at our stand.

LONGMAN LOGOTRON LTD, DALES BREWERY, GWYDIR STREET, CAMBRIDGE, CB1 2LJ. TEL: 0223 323656

Hi tech hope for the disabled

THREE days in Oldham recently provided a heartening example of how new technology can enhance the lives of thousands of disabled and disadvantaged people.

The venue was the town's Queen Elizabeth Hall. The event, the 89 Micros for Special Needs Exhibition organised by Northwest SEMERC (Special Education Micro Electronic Resource Centre) and sponsored by distributors John Simnett.

More than 50 exhibitors including 10 local authorities filled 70 stands to show how lives can be enriched by using micros. On display were a host software programs, peripherals and devices all designed for ease of use by the disabled.

But top honours for the three days went to the hundreds of pupils from 50 special schools in England, Wales and Northern Ireland who were bussed in each day to demonstrate how they make use of such aids.

Stand walls were plastered with school newspapers, newsletters and myriad other examples of work resulting from the combination of determined youngsters and microcomputers.

Typical were the pupils of Ysgol Belmont in Clwyd, former winners of the Daily Telegraph Schools Newspaper Competition. Making light of their disabilities, they toured the exhibition hall interviewing exhibitors and visitors then back at their stand they produced news sheets on the show using Prompt Writer word processor software and DTP package Stop Press from AMX.

"While they have been out doing interviews they have also been talking to the other children", said teacher Alan Nevitt. "It is that kind of contact and exchange of views which is very important in an event like this".

The exhibition mainly revolved around peripheral devices which allow people who do not have full use of their hands to access information without having to use traditional keyboards.

For the severely disabled there were the simplest of single switches like the Toucan Learning Tray from Toucan Communication Aids of Crewe. Connected to the user port of the BBC Micro, it was developed for use by children who cannot reach out to press keys and is a scanning equivalent of the Concept Keyboard. With one or two simple switches, the user controls a light beam which scans a grid of various choices.

At the other end of the scale were devices which compensated for the lack of control in various people wanting to use normal qwerty keyboards. On the Northern Ace Centre stand there were expanded keyboards which can fit over the normal keyboard to cut out the possibility of people with motor difficulties pressing the wrong key. They were also displaying tiny keyboards for users with conditions such as muscular dystrophy which causes restricted movement.

One of the most dramatic products came from MARDIS, the Microprocessor Assistance for the Disabled project of the University of Lancaster. It was Orac, a 128 key portable speech system which can be used to respond in synthesised speech for those who cannot speak themselves.

Costing £650 it can also be used with a number of other switches and keyboards including those used on the BBC Micro.

But not unexpectedly, it was the Concept Keyboard from Star Microterminals which pervaded most sections of the show.

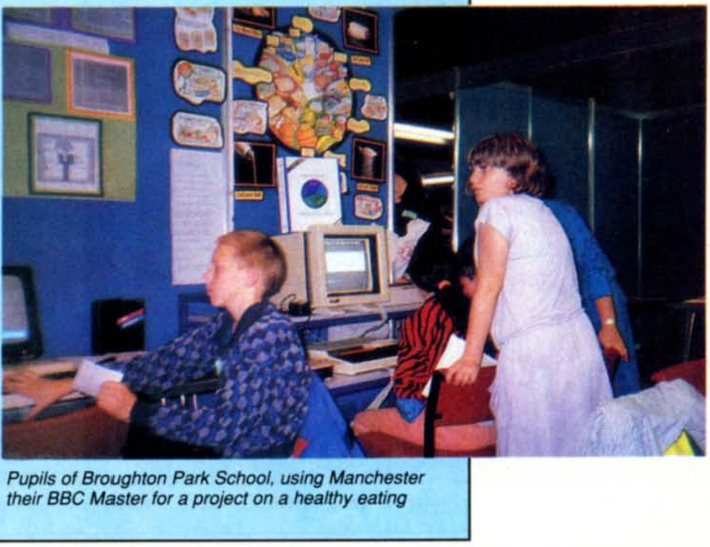
"There are 23,000 Concept Keyboards out in education at present but when you are talking about 27,000 primary schools, that is not many", said exhibition director and manager of the North West SEMERC Martin Littler.

"At present by far the largest percentage are for use with BBC Micros but other machines also support Concept Keyboards and their use is growing all the time. The wonderful thing about them is that they allow you to cover the whole of the curriculum at every ability level".

When it was first held last year, the exhibition was a one day event, but the decision to make it three days this year paid off. Among the thousands of visitors were education advisors, representatives of the DES, a representative of HMI, large numbers of teachers and social workers.

In addition to touring the stands, they had the chance to sit in on hardware seminars delivered by Acorn and other manufacturers.

"We see this event as a celebration of what is going on with the SEMERCS", added Martin Littler. This feeling pervaded from start to finish. Opening the event in glamorous style was actress Sandra Dickinson, the star of Hitchhikers Guide and Superman who is a patron of the Downs Syndrome Association.



Pupils of Broughton Park School, using Manchester their BBC Master for a project on a healthy eating

Healthy outlook

Ian Whitmore accesses a vast offline database

Healthdata Online

You can get online with Healthdata – at no cost apart from phone charges – on 01-986 4360, at 1200/75, Prestel format. No registration or ID is needed.

Product: Healthdata offline
Price: £4.95 (Archimedes/Compact), £2.95 (BBC B/Master – 5.25in 80 track DFS), £24.95 (Network – 5.25in ADFS)
Supplier: Healthdata, 21 Vicars Close, London E9 7HT.
Tel: 01-986 4360

HEALTHDATA offline is a disc-based cutdown version of the online health database. The review package was supplied in a distinctive blue folder, containing both a 3.5in Archimedes disc with a single sheet of operating instructions for each format. Start up on the Archimedes is easy: For Risc OS you double-click the red cross icon from the desktop, in Arthur you type *!BOOT at the Basic prompt – the 8 bit versions use ShiftBreak.

You are presented with a menu screen giving access to further menus. Using the database is like Prestel, with access to both the menu structure and by calling individual page numbers using *pagenumber#. For those users unfamiliar with Prestel there are several screens of help, accessible from the root menu, which explain clearly how to use Healthdata and an extensive index is available by selecting *199#.

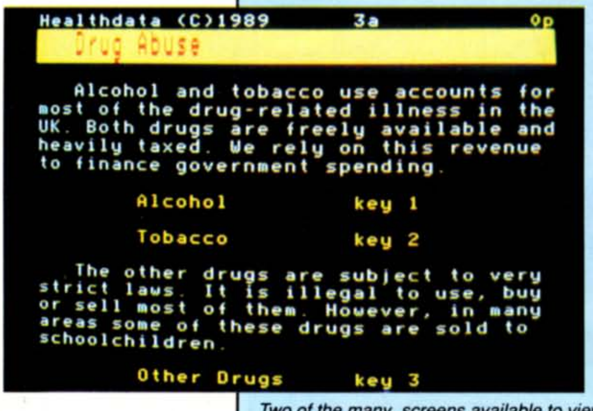
There is a carousel utility which displays 40 of the main menu screens on a timed basis. The next can be called without waiting for the timer by pressing the spacebar and any can be accessed in the normal way be pressing the relevant key. If no keyboard access occurs for several minutes the system reverts to carousel mode even if it had not previously been called.

The supplied disc is unprotected, but there is a stern message on the written instructions and on one of the help screens on the database that allows one copy for personal use only. The driving software works extremely well, and on the Archimedes consists of a 14k module and 14k of absolute code – making it unmodifiable for most people. The remainder of the disc space used contains the data – 388k, and its indexes – while 44 per cent of the media remains free.

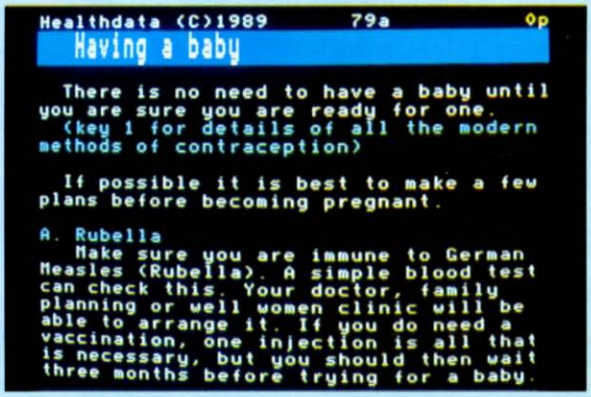
The range of information available is large, covering many aspects of health. The level of detail is suitable for schools, sixth form colleges and tertiary education. There are many areas in which the level of detail would prove useful to doctors, although the language avoids unnecessary technical terms. The screens shown below illustrate the wealth of data available.

Summing up

This is a valuable package, easy to use and containing a large amount of information. My only quibble is with the 44 per cent of empty disc space. Couldn't it have been filled with more data?



```
Healthdata (C)1989        3a          0p
    Drug Abuse

   Alcohol and tobacco use accounts for
most of the drug-related illness in the
UK. Both drugs are freely available and
heavily taxed. We rely on this revenue
to finance government spending.

         Alcohol           key 1

         Tobacco           key 2

   The other drugs are subject to very
strict laws. It is illegal to use, buy
or sell most of them. However, in many
areas some of these drugs are sold to
schoolchildren.

         Other Drugs       key 3
```



```
Healthdata (C)1989        79a         0p
    Having a baby

   There is no need to have a baby until
you are sure you are ready for one.
   (key 1 for details of all the modern
methods of contraception)

   If possible it is best to make a few
plans before becoming pregnant.

A. Rubella
   Make sure you are immune to German
Measles (Rubella). A simple blood test
can check this. Your doctor, family
planning or well women clinic will be
able to arrange it. If you do need a
vaccination, one injection is all that
is necessary, but you should then wait
three months before trying for a baby.
```

Two of the many screens available to view in the Healthdata package

Reading right

Product: Read-Right-Away Pack 1a
Price: £9
Supplier: H S Software, 56 Hendrefoilan Avenue,
Sketty, Swansea SA2 7NB.
Tel: 0792 204519

THIS package – part of the early language series from HS Software – covers a couple of areas teachers spend a lot of time dealing with. As with previous ones in the range there are two programs covering two specific reading skills.

The first program is Bert and Dick who are going to help you with b/d reversals. As teachers know – and parents should – this is a problem that a good many children fall foul of. The reasons are fairly obvious and the solution straightforward and largely undisputed – lots of practice.

Bert Bear and Dick Duck want to go to the circus, a jolly Mode 5 affair with an expectant crowd and human cannon ball. To *The Entry of the Gladiators* the pair are marched to their correct seats using the cursor keys. Helped along by a stilt walker and an acrobat, their correct seats are designated by blanks in words that need either a *b* or a *d* to complete them.

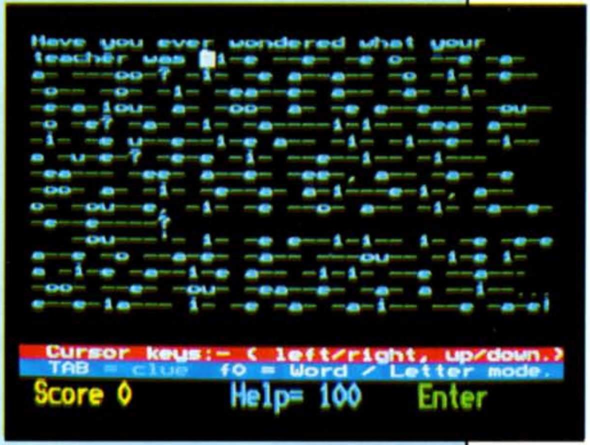
When the words are all completed correctly the human cannon ball – nice to see a woman in this role – is fired across the top of the screen and you can attempt to catch her. Nothing nasty happens if you fail.

The program allows for six levels of difficulty and provides the words contextually within simple sentences. It doesn't take long for any child to get through the text so there is provision for creating your own lists, though unfortunately these must be single words, not sentences. Thus it can be used easily within any reading scheme.

The second main option on this disc is **Magic Spelling**, a series of games based around the same principle – see a word, type it back. The exercise is presented in three different ways:

- **The Magic Box** shows the word and then wipes it out or, more specifically, the magician's beautiful assistant on roller skates wipes it out. The child is then invited to type it into the space left which retains the overall shape – the risers and descenders are left on screen.
- In **Magic Blocks** the words are presented as part of a box containing a man – perhaps a volunteer from the audience – who is chopped up into individual letters which are then presented out of order. With the aid of the skating assistant we are invited to reassemble word and man.
- **Magic Cards** shows the word on cards then turns them over. The child has to type the letters in – in any order – to re-display the word.

Again, word files can be created for use within these programs. All the above are set against time limits on skill levels ranging from one to five. The games can be played by individuals or in groups of up to four.



```
Have you ever wondered what your
teacher was
Cursor keys:- ( left/right, up/down.)
TAB = clue   f0 = Word / Letter mode.
Score 0          Help= 100     Enter
```

What we have here is a fairly basic but nevertheless effective implementation of the Look, Cover, Write, Check system developed over the past few years by Charles Cripps, an approach that is gaining support in education.

The trick, then, is not in the program but in the words the teacher or parent puts into the files. HS does not provide any guidance in this area. Perhaps this is the correct approach because this software may be used in a variety of ways, but it seems likely that the Magic Spelling part of the program would work best in conjunction with An Eye for Spelling from ESM or the book-based Catchwords scheme.

The package's production is rather spartan. The teacher's notes are two sides of A5 and the instructions laid out on the screen seem to be intended for children to read. But any child able to read them is unlikely to need this software.

There could also have been considerably more explanation of how word lists should be saved – there is no guidance as to when discs should be changed, for instance – an important point as you don't really want to store files on a protected program disc.

However, it should be said that all processes in the software are logical and there are no real problems finding your way through, it's just that to have it all written down helps the less experienced teacher take advantage of the package's features. Like the rest in the series, it provides useful extra tools for the teacher in the classroom.

Marshall Anderson looks at a simple but effective aid to teaching reading

Summing up

While this is a very worthwhile piece of practice software it does suffer from too little documentation. The programs, if uninspiring, do their job in a straightforward and uncluttered way. Because of that this package will be as welcome in the home as at school, and has a price that puts it in both camps.

Worksheets workout

Gordon Lethbridge has a routine which takes the chore out of creating problems

TEACHERS often search maths textbooks for further examples to consolidate a child's learning. But maths schemes do not always provide enough, especially for a child who is finding a particular concept difficult. Often many worked examples are needed – so here's a program to help provide them.

Finding, giving and marking extra examples can take an inordinate amount of a teacher's time and yet it is possible to produce sheets of practice sums with a micro and printer. This saves resorting to extra textbooks or writing examples on the blackboard to be copied, answered and later marked. The micro can work out the answers thus saving the teacher yet more valuable time.

Children learn quicker with immediate feedback, so having these answers printed on the sheet – to be folded under out of sight – enables them to mark their own work. However, for children who might cheat, the correct responses can be cut off and used later by the teacher to mark the work.

Type in the listing and check it using Get it Right! When run it prompts for the pupil's name, then prints three columns of sums with the answers printed in corresponding columns down the right-hand side of the sheet. These can then be folded under – a sample is shown opposite.

The same program can be adapted to print any type of sum required by just altering PROCinit and PROCprint – more of this later. The short messages at the top and bottom of the page can be changed to meet the needs of individual teachers.

Multiple copies

For conversion to multiple copy version make the following changes to Listing I:

```
   20 MODE 7:N$=""
   30 INPUT'"How many copies do you wa
nt?    "QN
   31QC=0
   32REPEAT
   33QC=QC+1
  135UNTIL QC=QN
```

Unfortunately, entering children's names so that the sheets can have the personalised look which children like can be time-consuming, especially with more than 30 children in a class. In this case it's better to use the multiple copies version – just make the changes shown in the panel above.

The routine will then print the required number of sheets, all of which will be different but within the same required parameters. This has the advantage that all the pupils of a class can easily be given different sets of questions to prevent copying.

The program is simple to use. The screen is cleared, and depending which version you are using, a message asking for a name or the number of copies you require appears. The micro prints a blank line before anything else so the printer needs to be set up with this in mind.

The output is on standard listing paper – not A4 – and the software itself is simple, so with only a smattering of pro-

The procedures

message Prints the message at the top of the sheet together with HELLO, which is followed by the user's name in the personalised version. The message itself is three lines of up to 40 characters but note that if you choose not to have three lines of text, blank lines should be output to prevent a breakdown in formatting. Printer codes have been avoided so the routine can be used on any make of printer.

init Sets the variables used in the printed sums within certain required parameters – for example numbers less than 20 when added giving answers up to 20. PROCinit in the listing given will print addition sums of two digit numbers with answers to 99 and the lines work as follows:

200 Sets the upper limit of the variables *A, B, C, D, E* and *F.*

210 Adds 10 to each of the variables to ensure that each is a two digit number – the upper limit in line 200 was set at 89 and not 99 for the same reason.

220 Ensures that the answer will not be greater than 99.

230 Computes values for the answer variables *X, Y* and *Z.*

print Prints out the sums in the desired format. The listing given prints addition sums in the vertical format:

```
 62
+23
---

---
```

This procedure will print out on most printers, but if any extra commands are needed they should be included in the main program by creating new line numbers between 10 and line 20.

Multiple copies

If other types of sum are required PROCinit and PROCprint need changing. Almost any type of sum can be set, although some will obviously be more complex to prepare.

It is not the purpose of this article to go into the variety of different types of sums and the changes to PROCinit that are required. However let's take a simple example to demonstrate the ease with which the program can be modified.

We can change the sums from addition to subtraction by changing the following lines in PROCinit:

```
180 IF A<=B OR C<=D OR E<=F THEN 290
190 X=A-B:Y=C-D:Z=E-F
```

and by making this change in PROCprint:

```
  250 PRINT TAB(7)"-";:PRINT TAB(19)"-
";D;:PRINT TAB(31)"-";F
```

Line 220 ensures that the top line of the sum contains the greater number while 230 supplies the answer variable and in line 300 the only change is that - is printed instead of the + sign.

gramming knowledge it can be developed much further than the two versions presented here to meet individual needs.

So now you have a routine that is capable of printing more worksheets to test addition than you could ever use, and it can easily be adapted to more of the four basic rules, fractions, decimals, percentages, money, length, capacity, weight and so on.

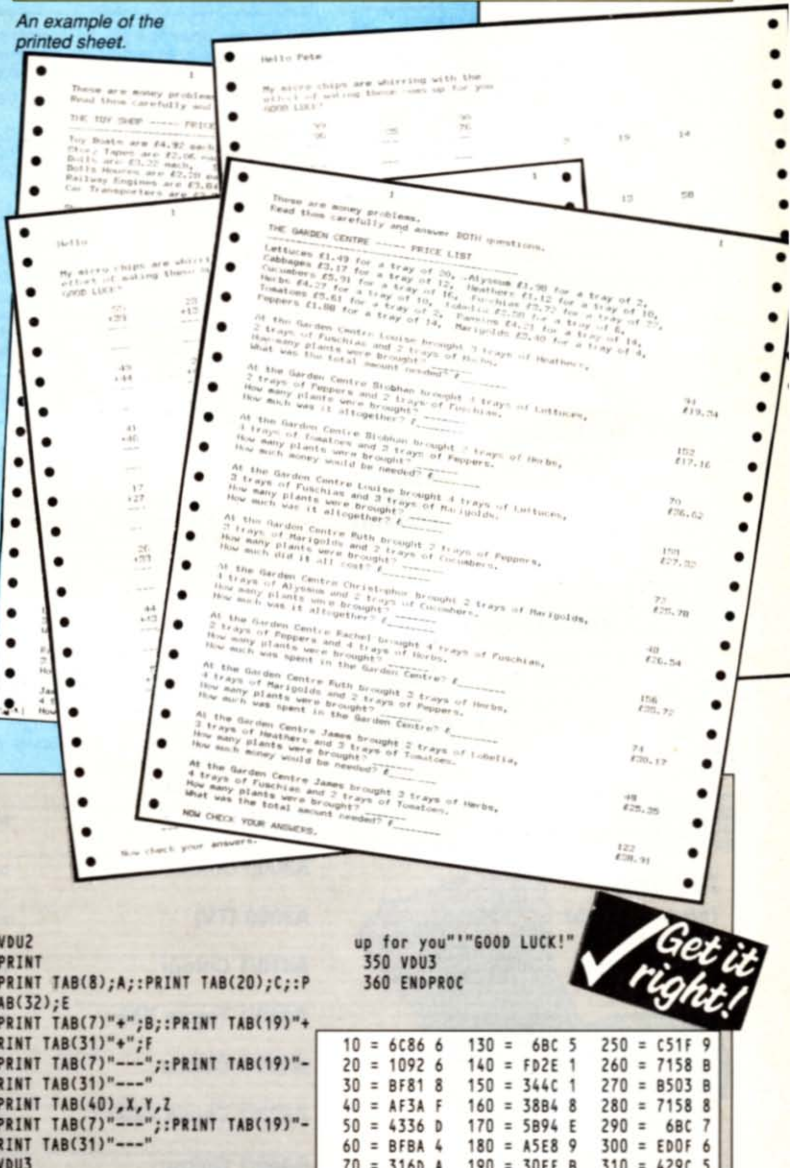
● In a future issue we'll look at how the program can be adapted to create sheets of problems.

Free software

Together with the listings presented here, subscribers will find 10 other versions of the program on the monthly tape and disc. Next month they will contain six problem-generating routines.

If you don't subscribe, copies of the 18 programs are available on disc from Mr. G. Lethbridge, 5 Kempton Terrace, Torpoint, Cornwall PL11 2DQ. Just send a formatted disc together with £2.00 – £3.00 if no disc is enclosed – and self-addressed packaging for the return of the disc. Please state whether a 40 or 80 track disc is required.

An example of the printed sheet.



```
   10 *FX15,0
   20 MODE 7
   30 INPUT'"What is your name? "N$
   40 PROCmessage
   50 N=0
   60 REPEAT
   70 N=N+1
   80 PROCinit
   90 PROCprint
  100 UNTIL N=9
  110 VDU2
  120 PRINT'"Now check your answers."''
  130 VDU3
  140 END
  150 DEFPROCinit
  160 A=RND(89):B=RND(89):C=RND(89):D=RN
D(89):E=RND(89):F=RND(89)
  170 A=A+10:B=B+10:C=C+10:D=D+10:E=E+10
:F=F+10
  180 IF A+BYY99 OR C+DYY99 OR E+FYY99
THEN
160
  190 X=A+B:Y=C+D:Z=E+F
  200 ENDPROC
  210 DEFPROCprint
  220 VDU2
  230 PRINT
  240 PRINT TAB(8);A;:PRINT TAB(20);C;:P
RINT TAB(32);E
  250 PRINT TAB(7)"+";B;:PRINT TAB(19)"+
";D;:PRINT TAB(31)"+";F
  260 PRINT TAB(7)"---";:PRINT TAB(19)"-
--";:PRINT TAB(31)"---"
  270 PRINT TAB(40),X,Y,Z
  280 PRINT TAB(7)"---";:PRINT TAB(19)"-
--";:PRINT TAB(31)"---"
  290 VDU3
  300 ENDPROC
  310 DEFPROCmessage
  320 VDU2
  330 PRINT:PRINT"Hello ";N$
  340 PRINT''"My micro chips are whirrin
g with the"'"effort of making these sums
 up for you"'"GOOD LUCK!"
  350 VDU3
  360 ENDPROC
```

Get it right!

```
 10 = 6C86 6   130 =  6BC 5   250 = C51F 9
 20 = 1092 6   140 = FD2E 1   260 = 7158 B
 30 = BF81 8   150 = 344C 1   270 = B503 B
 40 = AF3A F   160 = 38B4 8   280 = 7158 8
 50 = 4336 D   170 = 5B94 E   290 =  6BC 7
 60 = BFBA 4   180 = A5E8 9   300 = ED0F 6
 70 = 316D A   190 = 30EF B   310 = 429C 5
 80 = DEBB 5   200 = ED0F 2   320 = 169D D
 90 = BBAB 0   210 = 10CF 8   330 = 3C4B 2
100 = FB7D F   220 = 169D E   340 = 6543 2
110 = 169D 3   230 = FF3E 4   350 =  6BC E
120 = 9056 9   240 = 3618 7   360 = ED0F D
```

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A410/1 Colour	£120	£138.00	£107.90	£124.09	£1199	£1378.85
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A420/1 Colour	£170.43	£196.00	£152.86	£175.79	£1699	£1953.85
A420/1 + Taxan 770+	£204.35	£235.00	£183.97	£211.56	£2044	£2350.60
A440/1 Colour	£250.43	£288.00	£224.86	£258.59	£2499	£2873.85
A440/1 + Taxan 770+	£286.96	£330.00	£255.07	£294.06	£2689	£3092.35
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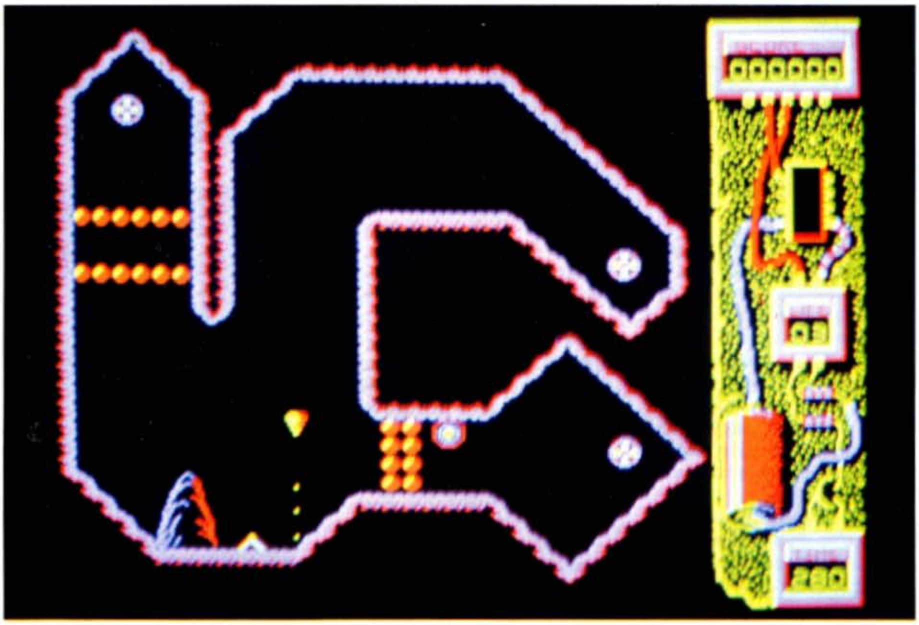
A410/1 Taxan 770+	on site contract at £85 OR £75 to spend	*Free* on site contract plus £100 to spend
A420/1 Colour	on site contract at £85 OR £100 to spend	*Free* on site contract plus £140 to spend
A420/1 Taxan 770+	on site contract at £105 OR £100 to spend	*Free* on site contract plus £140 to spend
A440/1 Colour	on site contract at £50 OR £120 to spend	*Free* on site contract plus £260 to spend
A440/1 Taxan 770+	on site contract at £60 OR £120 to spend	*Free* on site contract plus £275 to spend
R140	*Free* on site contract plus £120 to spend	*Free* on site contract plus £350 to spend

*Contract does not cover UHF Modulator. Above prices are ex VAT. Offer on current stocks only.

If you do not like any of the frills we offer ask for our barebone prices.

TEL: 01 205 9558

Price: £12.95 (disc) £9.95 (tape)
Supplier: ASL, Winchester House, Canning Road, Harrow HA3 7SJ.
Tel: 01-861 1166



Well-equipped survey ship breaking out

BLAST!

Dynamic geology

IT all begins as a straightforward astro-geological survey of an anti-matter planet in the outer reaches of the galaxy. As you make your final approach there is a rumbling below your ship, the ground falls away beneath you, and you tumble into the abyss.

After minutes of grappling with the controls you finally manage to stabilise the ship only to find yourself in the first of eight alien caverns.

Blast!, from ASL, is based quite unashamedly on the Superior Software classic – Thrust. Most of the original elements are there – the small triangular spaceship, the relentless pull of gravity, and the ever-present threat of alien attack.

Unlike the multi-screen, scrolling, backgrounds of Thrust, Blast! limits the size of its caverns to a single screen and achieves its complexity by reducing the size of the sprites. The game controls are very similar, allowing ship rotation, thrust and fire. There is no tractor beam because you aren't required to collect any power units.

Not only does ASL provide a facility for fussy players to define their own control keys, it also panders to the needs of those less wealthy BBC Micro gamesters who are condemned to play on a monochrome monitor. During the loading procedure you are asked what type of display you will be using; a monochrome reply results in the program defaulting to a selection of colours more suited to your needs.

The object of the game is to destroy all alien command centres of which there are three in each cavern. With these out of the way you are free to attempt the next level. Not surprisingly, the aliens aren't going to leave their command centres sitting around for any old Tom, Dick, or astro-geologist to blow to pieces.

The alien offence/defence system consists of several categories. Wall-mounted gun emplacements that loose a constant volley of randomly aimed laser blasts, highly mobile, but dumb, catherine wheel devices trundle around the cavern walls, and less mobile, but not so dumb, homing mines gravitate towards you relentlessly.

In addition to the indestructible cavern walls there are rows of little barrier blobs that create temporary obstructions throughout the caverns. The accessibility of some of the command centres is restricted by the physical shape of the cavern itself – nasty little narrow and angled corridors are often the only route to a centre.

On the higher levels the complexity and ferocity of the onslaught increases quite dramatically. Volcanic eruptions belch streams of explosive bubbles across your path. On level four the usually obstructive, but immobile, barrier blobs succumb to the effects of gravity and begin tumbling from the skies.

The leisurely, but thoughtful, approach that has served you so well in the previous levels now has to be abandoned in favour of a less systematic, blast everything, technique. It is at times like this that you really appreciate your ship's auto-fire cannon.

You begin the game with three spaceships, each having infinite supplies of fuel and firepower. Such generosity enables the cautious player to take his or her time to complete each cavern without loss of life. On the other hand the Joe Cool space aces out there are most welcome to try and take out the command centres before the count down timer reaches zero, thereby qualifying for a handsome bonus.

Blast! has managed to re-create the physics that worked so well for Thrust. Minute blips of thrust are necessary to maintain the ships position in space and all sideways drifts have to be compensated for with a brief thrust in the appropriate direction.

When you are expected to fly a ship through tortuously twisting narrow caverns the accuracy of the collision detection routines is of paramount importance. There is nothing more frustrating to an ace pilot than to see his ship consumed by flame when he knows for certain that he missed the wall with millimetres to spare.

Blast's routines are perfection. You can fly your ship to within a pixel of an object in complete confidence, knowing that the craft will not spontaneously combust.

The graphics used throughout will never win any prizes for style or originality, but I don't consider this to be a major failing. Blast's main strength is its superb gameplay.

This is a game that responds to the skilful player. With four fingers working in unison the ace pilot can pivot his craft is the narrowest of tunnels while simultaneously blasting mines and command centres.

Within half an hour you can be flinging the ship about at high speed on the lower levels in an attempt to reap the largest possible time bonus. I enjoyed it and I'm sure you will too.

Steve Brook

Sound	*7*
Graphics	*7*
Playability	*9*
Value for money	*8*
Overall	*8*

SCAPEGHOST

Price: £14.95 (80 track disc) £19.95 (Archimedes)
Supplier: Level 9 Computing, PO Box 39, Weston-super-Mare, Avon BS24 9UR
Tel: 0934 814450
Requirements: 8 bit BBC Micro with either sideways or shadow ram or Archimedes with PC Emulator

Cold comfort

THEY used to say that just before it dies a mute swan sings most beautifully – hence the term *swansong*. And that is the description we should apply to Scapeghost, the latest – and final adventure released by the wizards of Weston-super-Mare.

Just before I received the game the news was released that Level 9 is turning its talents to the arcade market after more than six years as uncrowned kings of the British text adventure scene.

So what are we to make of the year-long production efforts? Well some things can be taken for granted now like the sophisticated parser allowing high-level commands such as *Go to* (location), *Follow* (character) and especially *undo* which allows you to take back a move that proves unhealthy.

The storyline is a good one: Alan, an undercover detective, was trying to infiltrate a drugs gang. His last memory when he wakes up at his own funeral is of being in a car with Sarah, his partner. He discovers that Sarah is being held hostage and that his former colleagues think it is all due to his stupidity.

Alan has three nights – the three different sections – to clear his name and bring the villains to justice.

In part one – November Graveyard – he has three main tasks to accomplish. At the very start he is weaker than the proverbial kitten and can't even pick up a small object like a pebble. So his primary objective is to gain strength. The method used by weightlifters is the one to go for – start with something light and work upwards.

Task two involves recruiting help. This is where the high-level commands come in useful, since instructions can be given to other characters in the adventure. The helpers are other ghosts, no less useful on account of their being late, and in some cases, unlamented.

First on the scene is retired publican Joe Danby, who offers to show you around. Take advantage of this help by all means, but I found that simply to enter *Follow Joe* robbed me of a couple of opportunities to increase my strength. It was better at this early stage to make each move singly, so that I could pause and do things from time to time.

Third task on the list is that of finding a way to delay the villains and demolish their plans, so to speak. This can only be done with a little help from your friends once you have gained sufficient strength.

As always in a good adventure, you can wander around freely without having to do much problem solving in the early stages. This is vital, as it gives you the chance to start making a map – don't forget to type *Exits On* at the start of the game – so that when the guided tour of the cemetery is complete you'll have a good idea what to do, and where.

You'll soon find that two factors affect your strength, the presence of living human beings and bright lights. They should be avoided where possible.

Part two, Haunted House, finds you with increased strength and enhanced abilities: You'll need them all to be successful. You must find the evidence you need in the haunted house and work out how to attract the attention of the authorities. A light touch will be needed here.

Part three, Poltergeist, opens with you in imminent danger of a shower-bath from holy water as the villains force a priest to attempt an exorcism. And that's only the start of your troubles.

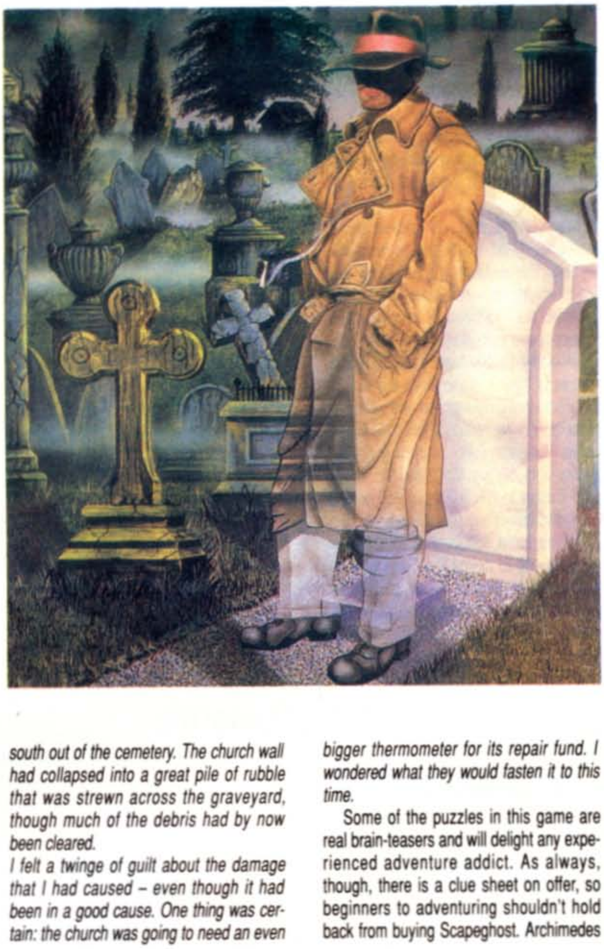
Basically, a successful bout of haunting, rescuing a damsel in distress (your ex-partner, Sarah) blocking the gangsters' escape and producing the evidence of their villainy are all that you have to do here. This part alone should keep the most avid adventurer quiet for a week or two.

The 30 or so illustrations – available as long as you have sideways ram – are up to the highest standards as you'd expect from Level 9, and the text is superb.

As always I'll include a small sample to whet your appetites:

I drifted south and was on a path leading south out of the cemetery. The church wall had collapsed into a great pile of rubble that was strewn across the graveyard, though much of the debris had by now been cleared.

I felt a twinge of guilt about the damage that I had caused – even though it had been in a good cause. One thing was certain: the church was going to need an even bigger thermometer for its repair fund. I wondered what they would fasten it to this time.



Some of the puzzles in this game are real brain-teasers and will delight any experienced adventure addict. As always, though, there is a clue sheet on offer, so beginners to adventuring shouldn't hold back from buying Scapeghost. Archimedes

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HOLED OUT

Price: £19.95
Supplier: The Fourth Dimension, P.O. Box 4444, Sheffield
Tel: (0742) 700661
Requirements: Archimedes series or A3000 with 1Mb ram or better. Holed Out!! not needed.

Around on your own

IF you've tired of the courses provided by Holed Out!! and the Extra Courses 1 and 2 why not get hold of the Designer and create a few rounds of your own?

Booting up the disc gives you the option of playing or editing. Choosing the latter puts you on to a screen where the files available on the current disc are listed.

When you first start there's a file called Templates which consists of 18 identical holes for you to modify.

From there you go to the main editing screen where the first hole is presented in plan view with a grid to help you align the obstacles. The bottom of the screen lists all your options – and there are plenty of them – while the top gives basic statistics like length, par, hole number and memory remaining.

To design a new hole you select the *new* option which clears out old data and asks for the statistics of the hole. From there the process is extremely simple. You select the terrain type – rough, fairway, water, path or bunker – then locate a centre owners should note that the black and white illustration option should be used in the PC version of the game. This, Pete Austin tells me, is because the disc uses the hardware of PCs from time to time. I must say, it didn't worry me at all – in fact I mostly played on my Archimedes while I wrote the review notes simultaneously on my 8 bit machine.

My recommendation is straightforward: Spend some of your Christmas money on this adventure as a top priority. My final comment is similar: If the Austins are finally bowing out of text adventures what a way to go! Scapeghost is quite simply superb.

Mad Hatter

Presentation	*10*
Atmosphere	*10*
Graphics	*10*
Value for money	*10*
Overall	*10*

VIEW II

AS a beginner I was amazed at the high quality of text and graphics in this adventure and found it very easy to move around the graveyard with Joe Danby. I'd already been advised to pick up everything but i seemed that I couldn't.

I had no problems running the PC version on my Archimedes and, even though only in black and white, the graphics certainly added to my enjoyment of the game.

Despite the very high quality of this adventure I can only think that it isn't designed for beginners. Having a clue sheet is all very well but I'd rather play games I can manage without help.

Peter Bryant

E-TYPE DESIGNER

Go faster by design

Price: £19.95
Supplier: The Fourth Dimension, P.O. Box 4444, Sheffield
Tel: (0742) 700661
Requirements: Archimedes series or A3000 with 1Mb ram or better. E-Type needed to play the game.

I GREETED the E-Type Designer with great excitement having exhausted myself zooming around the supplied tracks I was looking forward to creating my own. Double-clicking the Designer icon resulted in the standard E-Type loading screen appearing but with the words *Track Designer* in the corner.

There all similarity ends, as the next thing is a menu for loading, saving, starting a new track, editing an existing one or exiting the program.

Loading and saving gives you access to the five standard tracks – The Lakes, Antarctica, The Broads, The Sahara and Moonlighting – you can't alter the file names or the sprite graphics, only the layout.

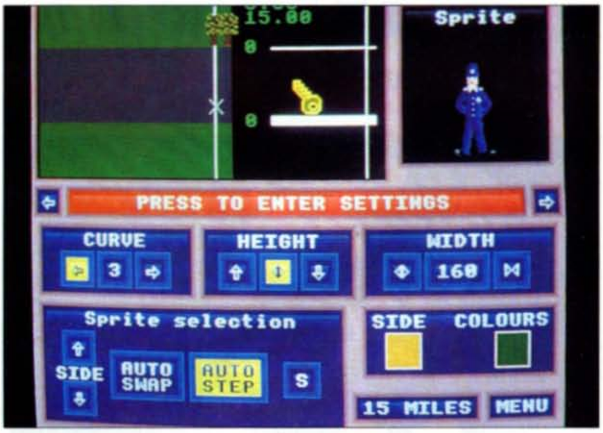
Having loaded a track you have the option – using *new* – to clear the track of sprites, straighten it, flatten it, change the length (from 5 to 35 miles) or all of these. Otherwise you can move straight to the edit screen.

A track is composed of sections each .005 miles long. One sprite, its position, ground colour on each side, height, curve and track width can be assigned to each section.

For each section you need to set whether the track should climb or descend, curve left or right – there are three degrees of curvature in each direction or none at all – the road width, which sprite should appear and where, and the side colours.

Having done this press the Select button of the mouse on the main bar in the middle and that piece of track is set. On a 35 mile track there are 7000 sections to be fixed, so the process can take a very long time.

There are a couple of built-in utilities to help you speed the process – auto-step which alternates the currently selected sprite with a blank for each position and auto-swap that changes the side the sprite appears. Additionally by using the Adjust button rather than Select a jump of several segments is made filling in colours, curve and height changes.



Using the keyboard you can press C, H or S to set the current curve, height or sprite without changing anything else. The up/down arrow keys in combination with Shift and Control can be used to jump up to a mile at a time which speeds up the process of finding your last position.

In use it's quite a time-consuming process and something that takes half an hour to do can take just five seconds to drive through at 250mph. But there's certainly a sense of achievement zooming through your own landscape.

Once you've mastered the tracks supplied with E-Type – or perhaps if you find them too hard – the Designer will certainly add more enjoyment to your driving.

Lazarus

Sound	*N/A*
Graphics	*8*
Ease of use	*6*
Value for money	*8*
Overall	*8*

DESIGNER

position. From here you draw triangles based around the first point, the last point clicked and the new one.

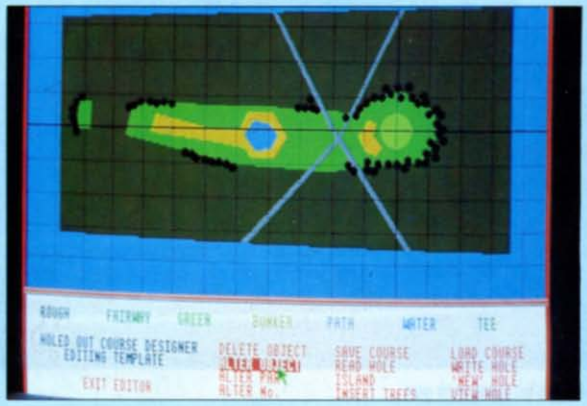
You can build almost any shape in this way. Trees are added separately and you can have up to 96 of them.

Once you've finished the hole you have to *write* it back to memory and then save the whole course. From the Designer you can view the course from any position – this displays how the main screen would appear if you were playing from there.

The Holed Out!! Designer is very easy to use and it makes a perfect complement to the original game.

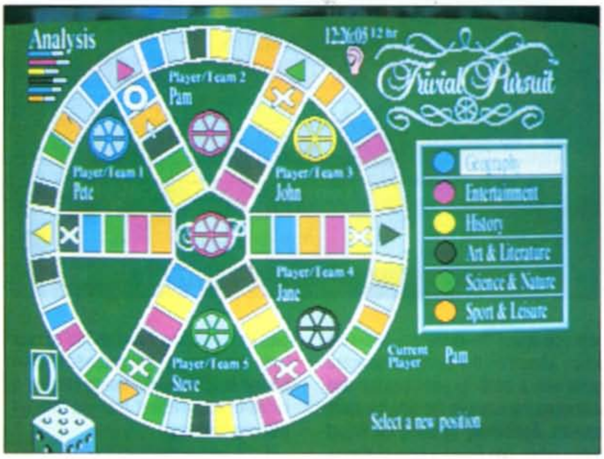
Steve Turnbull

Sound	*N/A*
Graphics	*8*
Ease of use	*9*
Value for money	*7*
Overall	*8*



TRIVIAL PURSUIT

Looking for answers



Starting play

Price: £19.95
Supplier: Domark Ltd., 204 Worple Road,
London SW20 8PN
Tel: 01-947 5624
Requirements: Archimedes series or
A3000 with 1Mb ram or better.

CHRISTMAS and New Year is the time when families get together, and what better way to spend those hours than with a friendly game of Trivial Pursuit? Even better, why not let your 32 bit micro read the cards and keep track of the positions?

The advantages are clear: No need to sit round a table on hard-back chairs, no board to be knocked over by marauding cats, dogs or infants and you don't have to put down your glass to read out the question.

In fact all you need do is stick the disc in the drive, click the icon and double-click the cute *pie* that appears in the directory window.

From here you get a slightly unfriendly request about whether you want waveform sounds but answering yes or no doesn't affect whether you are asked questions with sounds in them, so take your pick.

Next comes the pretty title screen declaring the various authors, copyrights and informs you that the interesting sounds are courtesy of EMR.

Finally you get on to the playing screen, where you are asked to enter the names of the players in turn – you can have up to six. The Trivial Pursuit board is shown plus, initially, a menu of options including a question timer (extremely useful), edit players and quit.

There's also the first mention of TP, that cute and cuddly question master. You can put him to sleep if he irritates you.

A further options screen lets you modify the way the onscreen clock appears and which combinations of text, graphic and sound questions you want. The edit players menu has very handy options to pause one or more players.

Play is simple. The program puts your pie in the centre and starts spinning the die located in the bottom left. When you click the mouse it stops spinning and all the possible positions you could move to are highlighted with Xs except the one nearest the mouse pointer, which is displayed as O.

You highlight the position you want to go to by moving the mouse pointer and clicking the Select button. When answering a particular question will get you a *piece of pie* – also known as a *wedge* or, colloquially, a *widgie*. There is an accompanying beep when that position is highlighted.

When you choose a position the screen switches to show a room and cute (but ugly) TP is there and proceeds to ask you the question. Actually the text of the question appears at the bottom of the screen and TP makes some squeaky noises. If it's a graphics question you get a picture, or you may hear some music.

There are some incomprehensible graphics and occasional indefinable music, but on the whole both are satisfactory and certainly a bonus over the board game.

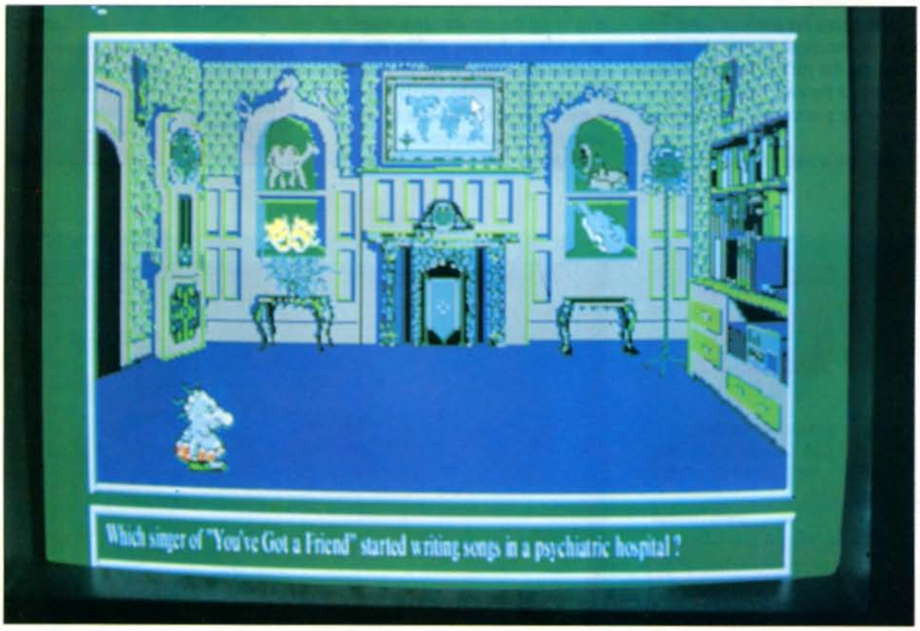
If the question you've answered will give you a wedge you hear a beep. The pies of opponents not actually in play do not appear on the board. All the usual Trivial Pursuit features are there – Go again board positions, choice of question in the centre and so on.

At any time you can click the analyse icon in the top left of the screen and see how good you are. What you see is the total number of questions answered, how many you've got right and your percentage right.

Also there's a similar breakdown by subject – this means that if you're a serious strategic player you can optimise your route round the board by only moving to your preferred subjects. That might seem obvious, but I discovered I had a much better chance in the area of entertainment than I previously thought.

I found Trivial Pursuit fun to play and unlike most board game conversions it actually does work on screen. The ability to include graphic and sound questions extends its capabilities tremendously. Definitely worthwhile.

Steve Turnbull



Which singer of "You've Got a Friend" started writing songs in a psychiatric hospital?

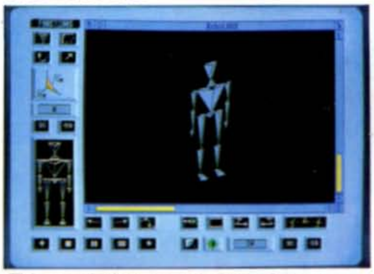
TP, the question master, in his room

Sound	***6***
Graphics	***6***
Playability	***10***
Value for money	***9***
Overall	***8***

SILICON VISION

SOFTWARE FOR THE ARCHIMEDES COMPUTER SYSTEM

RoboLOGO



This revolutionary new extension to traditional LOGO, made possible only by the enormous computational power of the Archimedes, provides three dimensional control of an articulated humanoid or animal figure through the use of a standard LOGO language. Sophisticated natural commands such as 'Walking', 'Turning', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure. This natural form of graphical response is readily understood by students using LOGO to learn the concepts of logic & reasoning. The traditional Turtlegraphics & 3D Glider features are also supported for easy transition to this innovative concept in natural response LOGO.

£69.95 (ARC) New

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The package includes both the sophisticated design environment of SolidCAD and the high speed capability of a Realtime Graphics Language module to provide the fastest programmable animation facilities bringing any design to life from within your own programs. Facilities include 3D Rotate, Scale, Orbit, Perspective, Position & extensive display styles for wireframes, hidden-surface removal, smooth shading and multiple light sources with individual intensities.

£89.95 (ARC) New

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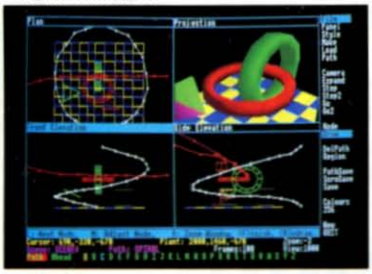
£89.95 (ARC) New

FILM-Maker



The package provides an interactive environment to create animated sequences of 3D scenes with dynamic camera motion for 'walk-throughs' and 'flight-paths' for objects within the scene. The fully graphical environment requires no programming or textual entry and the capability to calculate smooth shaded frames of complex scenes with lighting effects at rates of 60/minute allows fast interactive design of animated sequences. A large number of these frames can then be stored using built-in compression facilities to play-back at video scan rates for on-screen animation or video recording. Fully compatible with SolidCAD and SolidsRENDER, animation Oscars are now within your reach.

£79.95 (ARC) New

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The next generation CAD package combining 2D Draughting and 3D Modelling techniques with advanced smooth shading and lighting effects to provide the ultimate 3D Draughting System for Architectural design, Interior design, Engineering design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly in 3D to visualise a model while it is being created. Powerful zoom, pan, sweep, extrude and macro facilities are also provided to enhance design productivity.

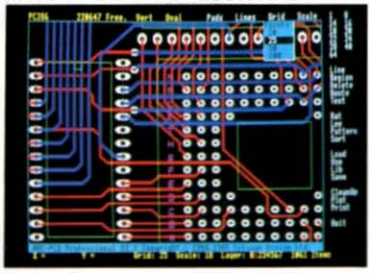
£49.95 (ARC) New

SolidTOOLS

The fully integrated environment for 3D CAD, Animation, Rendering & Hardcopy. The package includes SolidCAD, FILM-Maker, SolidsRENDER, Realtime Graphics Language, SuperDump & SuperPlot for a turnkey solution satisfying all your requirements.

£275.00 (ARC) New

ARC-PCB Professional



The ultimate PCB design package developed specifically for the Archimedes is now even better. ARC-PCB Professional follows on the success of the original and provides Faster & Improved Automatic Routing, Oval & Circular pads with fully variable sizes, Faster Redraw, Extended library part manipulation, & Instant Editing operations for substantially increased productivity. This Professional version operates orders of magnitude faster than the original and surpasses all other PC-based PCB design systems in features & speed of operation for the fastest turnaround from concept to finished board design. Take the lead for your PCB designs before your competitors do.

£375.00 (ARC) New

SolidsRENDER

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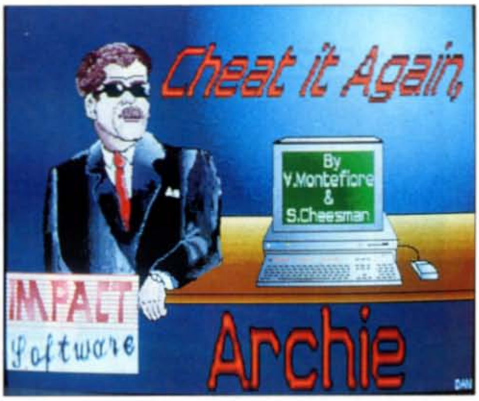
Cheat it Again, Archie

... getting to the top



MOTIVATED by the success of their earlier release of pokes and cheats compiled on disc and tape for popular BBC and Master games – the Cheat it Again Joe series – Impact has decided to release a brother disc for the Archimedes.

Renamed Cheat it Again Archie, Joe's older brother has only one volume to his name at present providing various assorted sections of code to help progress through 12 early Archimedes releases.

Unfortunately, the programs supplied have not received the few necessary tweeks to make them Risc OS compatible, so this limits interest in this review to those still with Arthur 1.2 OS. No plans appear to be around for this compilation to be adapted, which is a shame as with only a few alterations – to the !BOOT file and so on – I'm sure it could be coaxed into running.

Upon successful loading, a clear mouse-driven menu follows the title page. Here a list of games and their cheats are given. Including Pacmania, Zarch, Quazer, Terramex, Fireball, Startrader, Hoverbod, Orion, Alerion, Freddy's Folly, Minotaur and Conqueror.

Selecting one prompts the program into giving details of what pokes are available, plus additional information such as level passwords. Options are provided to load the cheat, return to the menu or select/run another poke.

Once you have selected your cheat, there's an automatic Control+Break and a message is displayed requesting the original game disc. From this point the game loads apparently normally, yet once in memory the cheats take effect.

So how does this add to a game's enjoyment. We tried it out on Freddy's Folly from Minerva. Aimed at the younger age group, or in its own terms: "A nice slow game, for those who find computers a bit much". It is obvious that the author's intention was to concentrate on the graphical and humourous aspects rather than on action-packed excitement.

Gameplay centres around two castles, one is yours and it is being bombed by jealous Sir Freddy. For some the game may be too simple even without the cheat, while newcomers may find it discouragingly easy to be blown away.

The cheat stops your defences from being turned to rubble. This may at first seem to make Freddy's Folly a little pointless, but it does enable some practise at gauging projectories of ship and balloon.

Impact's programmers are working on a Risc OS version of Cheat it again, Archie at present. This is not a straightforward conversion though, as games re-configure the Archimedes in different ways. However, Steve Botterill of Impact says that should anyone buy an Arthur version an upgrade will be available.

A faster game option may have been useful but really no advantages are gained in allowing you to progress to a point where new challenges – and renewed interest – are created, simply because the game doesn't contain any.

The others are just as well provided for – if not more so. In Conqueror you can alter your tank's specifications to an invincible level, while in Quazer and Pacmania immortality is possible. In the latter working through the mazes becomes a doddle thanks to an added unlimited credit facility. Most usefully, any hidden cheats included in games by the original authors are also detailed.

Despite the obvious value of this disc, I still have serious reservations over recommending it. It certainly isn't compatible with Risc OS and is surprisingly expensive in comparison with the Joe series. The Joes retail at £4.99 but for eight less cheats you must pay an additional £6 with Archie.

Unless the new operating system is supported, sadly this potentially desirable product will limit itself to use by a fast diminishing Arthur 1.2 user base.

Matthew Ridd

Sound	*N/A*
Graphics	*N/A*
Playability	*9*
Value for money	*5*
Overall	*6*

Cheat It Again Joe 4

... more for your money

Price: £4.99 (disc only)
Supplier: Zentrix Software, 296 Newton Road, Rushden, Northants NN10 0SY.
Tel: 0933 55273

MANY of you will be familiar with the Cheat It Again Joe series of tapes and discs: Collections of easy-to-use pokes and cheats for most of the popular BBC Micro games.

The compilations are the brainchild of Mark Gidley, a regular contributor to the Hac-Man column, and is a direct development of The Pokes Disc that he used to sell via mail order.

I reviewed the first two Joes with enthusiasm in the November 1988 issue of *The Micro User*, and the latest addition to the range only strengthens my opinion.

The first three volumes of Cheat It Again Joe were released by Impact Software but Joe 4 is being marketed directly by mail order from Mark's own Zentrix Software. It is available only on disc, because Mark found that the demand for a disc version was much greater than that for tape.

However, in common with the earlier Joes, this one features a full range of pokes for both cassette and disc versions of all the featured games.

Cheat It Again Joe 4 is just as easy to use as its predecessors. Simply press Shift+Break to load a menu page: It invites you to use the cursor keys followed by Return to select *VOLUME FOUR* or *UPDATE*.

The former gives you a list of new games or games recently released on compilation and you can either select one or press the spacebar for a further selection.

Update displays the names of half a dozen games for which pokes have been published in previous issues of Cheat It Again Joe. As the name implies, these are updates on those which appeared in earlier Joe and have been included because the game has since been re-released on a compilation, or simply because Mark has written additional routines for a game featured earlier in the series.

I had only a couple of minor gripes with Joe 4. Pressing Shift+Break loads a menu page which, on my review copy, is loaded directly into the area of memory used to display a Mode 1 screen.

With most BBC Micros this has the effect of making the menu appear suddenly but if the machine has shadow ram and is configured to default to one of the shadow modes you are presented with a blank screen and a small red box.

Furthermore, I could not switch from the Volume Four menu to the Update menu without pressing Break, reloading from scratch and selecting the other option. Mark assures me that both of these shortcomings will be corrected.

For less than half the normal price of a BBC Micro game, Cheat It Again Joe 4 gives a whole new lease of life to more than twenty recent bestsellers.

Hac-Man

Sound	*N/A*
Graphics	*N/A*
Playability	*9*
Value for money	*10*
Overall	*9*

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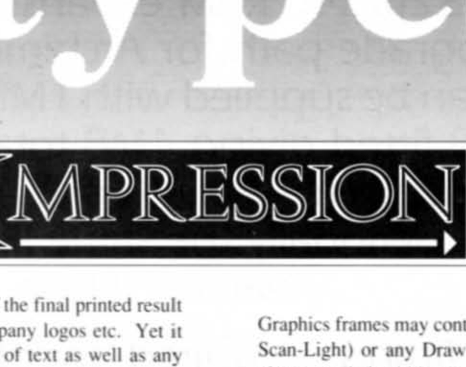
Designed, & typeset

Impression is more than a word processor, it can handle complete documents ranging from whole books, newsletters, or technical articles, to single page advertisements. It can handle all aspects of the final printed result - the text, line graphics, photographs, company logos etc. Yet it can still be used to bash out a single page of text as well as any 'simple' word processor. It is a document processor.

RISCOS

Impression is one of the first products to take full advantage of the new multi-tasking WIMP based operating system for the Archimedes. Because it uses the windowing/pointer/menu facilities the product is simple and intuitive to use - long gone are the days when users had to remember commands, or codes for each operation. Considerable design effort has been expended on making the program simple to learn and simple to use - only five main menu options control everything within Impression.

Impression has been optimised to ensure the fastest possible screen update and this, in conjunction with the very responsive windowing environment, ensures even the most experienced word processor user will gain considerable benefits from this form of control.



Frames

Impression is a frame based page layout system. All objects on the page are held within frames which may be positioned freely anywhere on the page. Frames can contain text or graphics, they may overlap, and may be transparent or have any coloured background. They can have a variety of borders displayed around them and may be arranged in columns to create multi-columned text. Text may be forced to automatically repel around any frame so enabling text to flow around graphics.

A text frame may be linked to any other text frame (even on subsequent pages) so text will automatically flow from frame to frame and page to page. Since Impression has been designed primarily as a word processor, it is important that users can enter text unhindered. Therefore frames and pages can be created automatically as text flows out of a frame, ensuring that while text is being entered you do not have to worry about creating new frames or pages.

Graphics frames may contain any sprite (for example images from Scan-Light) or any Draw file. All graphic frames may have the picture scaled within the frame to any degree. In addition the aspect ratio of pictures can be controlled and even locked to any required value.

Windows

Impression can handle up to 16 documents in memory at any one time. Each document may be viewed in one or more windows. Each individual view may be scaled as required so that, for example, one view may be at 100% while another window shows the same document scaled to 20% so showing a live 'mini' view. This mechanism also allows two different parts of a document to be edited without the need to scroll between them. Impression can display its pages within the window as side-by-side left/right pages, and as vertically arranged pages in a more traditional word processor-like fashion. Not only does this present a far more WYSIWYG display but is also allows instant scrolling to any position in the document. There is no need to specifically turn over the page, thereby overcoming a limitation of traditional DTP systems. Since any window can be scaled to show a reduced view, this system also allows multiple page 'thumb-nail' views.

Spelling checker

Included with Impression is a 60,000 word spelling checker providing some of the most advanced spelling facilities. Check-as-you-type, multiple user dictionaries, ignore dictionary, crossword and anagram solving and an intelligent 'guess' feature are included. Other related dictionaries control automatic abbreviation expansion as you type, and a hyphenation exception dictionary provides precise hyphenation control over and above the normal automatic hyphenation.

arranged on

IMPRESSION
THE DOCUMENT PROCESSOR FOR THE ARCHIMEDES
Acorn

Styles

Like the most powerful word processors on the Mac, Impression supports a system of styles. Rather than having fixed text effects such as bold, underline etc, Impression allows the user to apply any user named style to any part of the text. This style may be defined and re-defined at any time to represent any combination of stylistic effects.

So, for example, one style, perhaps called 'heading' may specify text to be in a Times font, one inch high, in italics and centered. This style may then be applied to any region of text with one menu option (or just one key-press). A traditional word processor would require four separate operations to be applied for each heading (assuming it could do it at all).

Printing

Included are the latest RISCOS printer drivers for Epson compatible 9 and 24 pin printers, LaserJet compatible laser printers and ink-jet printers, and PostScript printers. These printer drivers ensure the output is to the maximum resolution the printer can manage so ensuring the print is to the highest quality possible. In addition Impression supports 'text mode' draft printing so text may be output as fast as possible using the printer's character set. The user therefore has a choice between fast text only printing or high quality text (any font, any size) and graphics printing.

Impression comes with a 'no quibble' money back guarantee when purchased direct from Computer Concepts.

This advert was designed, laid out and edited on Impression. All logos were created in Draw and imported into Impression frames. The pages were then 'printed' via the PostScript printer drivers to disc. This disc file was then sent directly to a Linotron phototypesetter, which output the final camera ready artwork. The studio photographs were pasted in separately.

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Contact Computer Concepts for a more detailed brochure.

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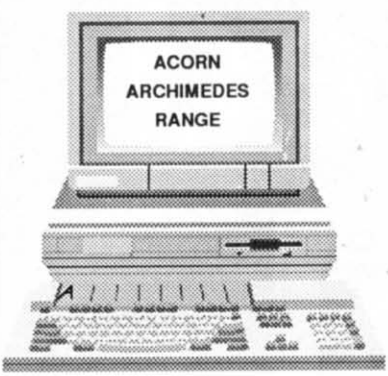

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Setting out to impress

Bruce Goatly lays it on the line with a document processor

Product: Impression
Price: £171.35
Supplier: Computer Concepts Ltd, Gaddesden Place, Hemel Hempstead, Herts. HP2 6EX
Tel: 0442 63933

ONCE upon a time life was pretty straightforward. If you wanted to do word processing you would buy a word processor package and if you then wanted to print it out as nicely laid out pages you would feed the text into a desktop publishing program. But now the boundaries between word processing and DTP are becoming blurred, because Computer Concepts describe Impression for the Archimedes as a document processor – a word processor with DTP capabilities.

Will Impression satisfy those who deferred buying DTP software until there was more choice than Acorn's own brand? The only way to be sure is to compare them, so to some extent this review will do just that. The review copy of Impression was a pre-release version (0.71) though the completed software should differ only slightly.

The package consists of a stylish ring-bound 200 page manual, four discs, a short but remarkably comprehensive and readable book on the fundamentals of DTP and design, and a hardware key – or dongle – which fits into the parallel printer port. The discs contain the Impression software, the Acorn printer drivers, the new Acorn font manager with its 13 fonts, an example document, art files and utilities.

The first thing you notice on starting Impression up is that on a 1 Mb machine there is no need to ration out the memory. There is plenty to go round – in fact there is room for a font cache of more than 200k.

Unfortunately the software has grown so much in development that on a 1 Mb machine Draw cannot now work alongside it.

The second thing is that, as with Acorn DTP, when you click on the icon to start up the application you find it is frame based, the difference being that a frame can contain only text, drawings or sprites and not combinations of them.

Sound advice

Let's look first at how it performs as a word processor. Your most important equipment for this has to be a suitable screen – no matter how powerful or user friendly the software, if you can't read the text you might as well use the Risc OS Edit application. The manual gives sound advice about this, and even if your screen is only mediocre you can always type in large print and redefine the text size later.

Impression has all the facilities you would expect of a word processor – word wrap, text formatting, tabs, block delete, move and copy, search and replace, rulers for text width.

There is an extensive but straightforward menu system, although for experienced users a wealth of key shortcuts give rapid access to most useful functions. Some will please Wordwise Plus or Inter-Word devotees, for example Control+A for delete at cursor and Control+S for swapping case.

The software also includes the Spell-Master spelling checker module which can be used as you type or on a complete text, and it can be extended with your own dictionaries. Automatic hyphenation is available, making use of an exception dictionary to which you can add your favourite awkward words.

Movement from one page to another is easy and fast – you just scroll – and text flows automatically from page to page, creating new ones as you type. You can have more than one view of the same document on screen at a time, and up to 16 documents in action simultaneously. The range of magnifications on screen is enormous, from 1 per cent to 975 per cent of actual size.

The clipboard concept is used to good effect. One handy facility is that any keypress will cut a marked section of text to the clipboard. It can be disconcerting at first to see a marked passage disappear unintentionally – it's still on the clipboard so it can easily be restored – but once mastered, overtyping a passage becomes delightfully easy. Second thoughts become second nature.

So Impression's claim to be a word processor is justified. How does it fare in the DTP stakes?

A fundamental difference between Impression and Acorn DTP is in their concepts of how chunks of text are assigned their different attributes – fonts, sizes, layouts, spacing.

In Acorn DTP the basic unit of a style is the paragraph. In Impression everything starts out with a foundation style called BaseStyle – which you can redefine – and further styles can be laid

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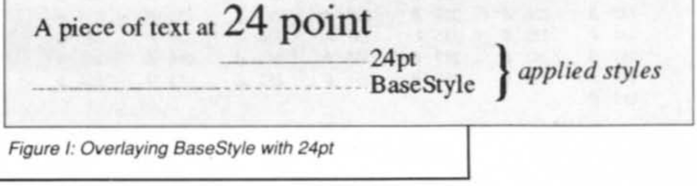

Figure I: Overlaying BaseStyle with 24pt

➤

on top so that anything from a single letter to a complete story can be given a different appearance. It takes a bit of getting used to, but is a much more flexible approach than Acorn's.

Suppose you want to define a heading to be centred in a larger size of type, say 20 points. All you do is define a style – call it Heading – defining the size as 20pt and the format as centred but leaving everything else undefined, and select that style from the menu or by a key shortcut. Then anything you type until you change style again will be in the normal font but larger and centred. Figure I shows an example of how overlaying styles works.

The important outcome of this is that if you later decide that the document should be in Homerton font rather than Trinity, all you need do is alter the BaseStyle, which will cause all the text and headings to adopt the same font as long as none of the overlaying styles explicitly specify a font.

Other benefits

This does have the slight drawback that, unlike in Acorn DTP, you can't just ask for bold type in general: The style has to specify which font the bold belongs to. The other side of the coin is that it is much easier to add new fonts to your collection – they are added automatically to the list in the menu, whereas the Acorn system requires changes to be made to a configuration file.

Another benefit is that you can apply a style to any piece of text, not just paragraphs. I needed to prepare a printout of a whole font with the corresponding Ascii numbers, and Figure II shows part of the result, with the characters in a different font from the numbers.

Changing the displayed font was easy with Impression – just by altering the style definition – but with the Acorn system each individual character's style would have to be redefined.

The maximum font size is limited only by the page area, so you can have a single letter filling a page if you wish. A useful feature is the ability to alter the aspect ratio of fonts so that letters can be stretched or squashed, either to fit a defined width or to give the effect of more type faces. Figure III is a sample page from a cassette inlay, where width was at a premium.

Another significant difference from the Acorn package is Impression's non-modal, context-sensitive operation. This avoids the need to be in frame mode to adjust a frame, or in text mode to type text.

To select a frame, you just click in it, to move one you click and hold for about a second until the hand icon appears. To select text just move the text cursor and click.

A selected frame has the standard eight handles for adjusting its size. Selecting a piece of text is done either by successive clicks on Select – one for cursor position, two for a word, three for a line, or a click on Adjust to mark everything from the previous cursor position – or by a click and drag operation.

The lack of a paragraph mode makes it a little less convenient than in Acorn DTP to apply a style to a whole paragraph.

You don't need to use the scroll bars to move around a document: Positioning the cursor outside the main frame changes it to a hand with which you can push the page about. Another feature is that if you move the cursor out of the window during a drag operation the document scrolls automatically in that direction.

Distinct differences

The main omission is of a built-in graphics facility. Had the software been able to run alongside Draw on a 1Mb machine as planned, this would merely have been an inconvenience. Simple vertical and horizontal lines are provided for by defining thin frames with a dark background.

As with the Acorn package, the structure of a whole document is determined by master pages, but there are distinct differences. The first is that a default option allows you to define the master page that will be set up each time Impression is started. The second is that changes made to a master page of an existing document are reflected throughout immediately.

A document can consist of several different chapters, each with its own master page. And

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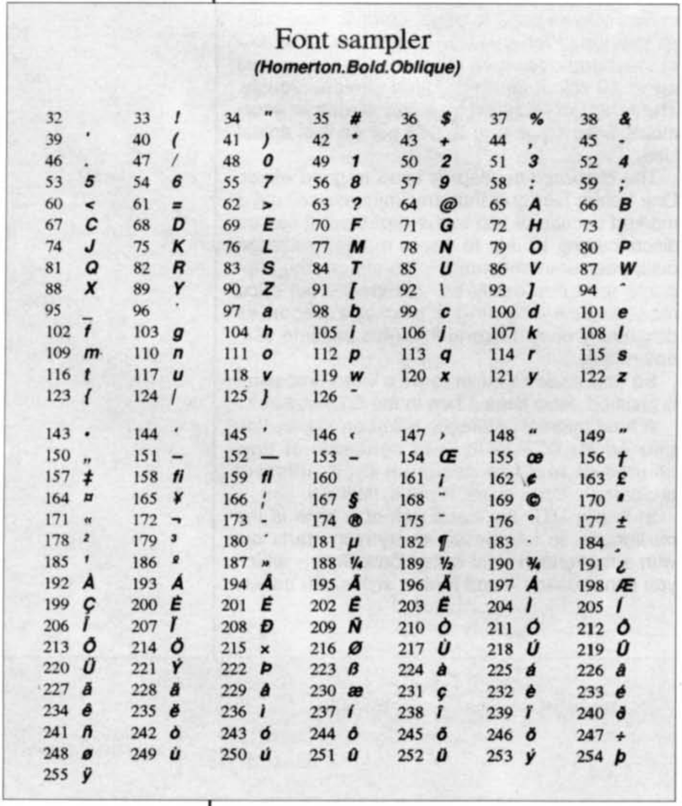

Font sampler

(Homerton.Bold.Oblique)

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60	<	61	=	62	>	63	?	64	@	65	A	66	B
67	C	68	D	69	E	70	F	71	G	72	H	73	I
74	J	75	K	76	L	77	M	78	N	79	O	80	P
81	Q	82	R	83	S	84	T	85	U	86	V	87	W
88	X	89	Y	90	Z	91	[	92	\	93	]	94	^
95	_	96	`	97	a	98	b	99	c	100	d	101	e
102	f	103	g	104	h	105	i	106	j	107	k	108	l
109	m	110	n	111	o	112	p	113	q	114	r	115	s
116	t	117	u	118	v	119	w	120	x	121	y	122	z
123	{	124	|	125	}	126	~						
143	•	144	‘	145	’	146	‹	147	›	148	“	149	”
150	„	151	–	152	—	153	−	154	Œ	155	œ	156	†
157	‡	158	ﬁ	159	ﬂ	160		161	¡	162	¢	163	£
164	¤	165	¥	166	¦	167	§	168	¨	169	©	170	ª
171	«	172	¬	173	-	174	®	175	¯	176	°	177	±
178	²	179	³	180	´	181	µ	182	¶	183	·	184	¸
185	¹	186	º	187	»	188	¼	189	½	190	¾	191	¿
192	À	193	Á	194	Â	195	Ã	196	Ä	197	Å	198	Æ
199	Ç	200	È	201	É	202	Ê	203	Ë	204	Ì	205	Í
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213	Õ	214	Ö	215	×	216	Ø	217	Ù	218	Ú	219	Û
220	Ü	221	Ý	222	Þ	223	ß	224	à	225	á	226	â
227	ã	228	ä	229	å	230	æ	231	ç	232	è	233	é
234	ê	235	ë	236	ì	237	í	238	î	239	ï	240	ð
241	ñ	242	ò	243	ó	244	ô	245	õ	246	ö	247	÷
248	ø	249	ù	250	ú	251	û	252	ü	253	ý	254	þ
255	ÿ												

Figure II: A font sampler

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Utilities

SEVERAL utilities are provided with the software to make your work much simpler. The first is !FontDraw, which lets you type in a few characters and converts them to Draw file format; they can then be loaded into Draw or transferred direct to a waiting frame and treated as graphics. This is useful for creating dropped capitals, among other things.

Then there's !NewModes, which provides many new screen modes – numbers 64 to 87 – with a variety of different sizes and resolutions, for ordinary and multisync monitors. Even the simplest provides a double height 16 colour screen. So that you can view more of your page.

!SuperMono is an application for use in monochrome modes and is intended to give a better representation of grey scales.

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text flow can be automatic from column to column as well as from page to page.

Importing text or graphics is easy – just drag the icon from the filer window on to an empty frame. Styles can be specified in imported text, but the syntax is slightly more complex than in Acorn DTP and any that are unrecognised are not added to the list of styles. Instead they are merely imported as part of the text, which is not as helpful.

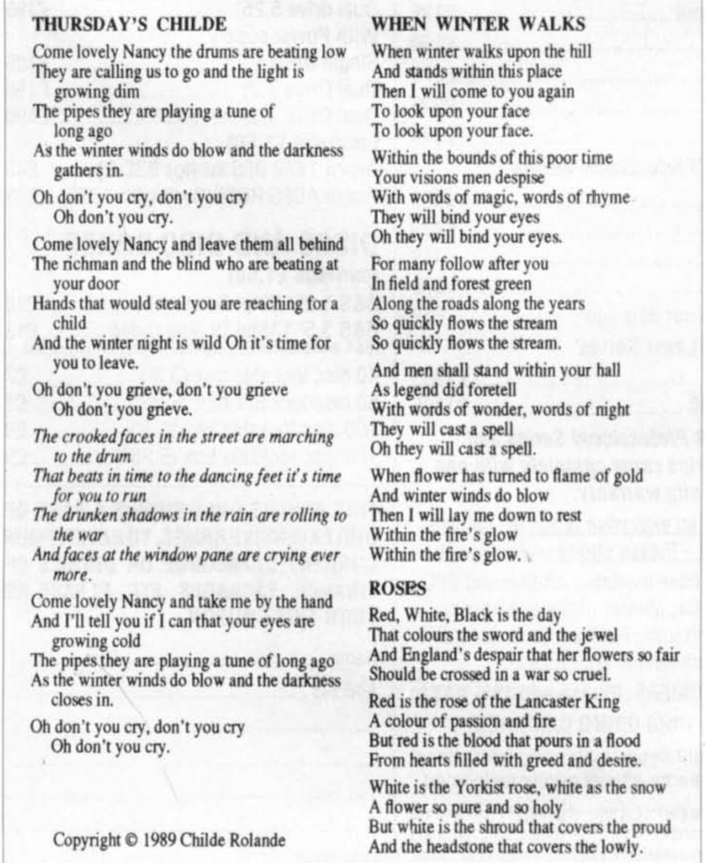
Various loader modules are provided to convert text from other word processors to Impression format. And saving a text story can be done with or without carriage returns, line feeds or specification of style changes. I would have preferred my preferences to be remembered from one save to the next.

Each document is saved as an application of its own, so all the files can be copied or moved together, and Impression can be started up by double clicking on a document name. To optimise memory usage the disc is used as virtual memory to store parts of long documents.

Rather than using slave files, however, Impression uses the document file itself, modifying it as the document changes. This has two important consequences: If you reset your machine before saving the changes you may end up with a corrupt file and you can't conveniently load a document with one name, modify it and save it repeatedly under a new name.

As well as a much greater flexibility in on-screen magnifications, Impression allows documents to be printed out at virtually any size and lets you fit several pages on to one sheet. You can also print pages in reverse order, with or without illustrations, and multiple copies can be collated or uncollated.

Probably the most noticeable difference between the two packages is Impression's much greater speed. It is markedly faster at refreshing even a text page, and there is practically no waiting for sprite graphics to be drawn or redrawn. In fact, going back to Acorn DTP is a frustrating exercise because everything seems to take so long by comparison.



THURSDAY'S CHILDE

Come lovely Nancy the drums are beating low
They are calling us to go and the light is
growing dim
The pipes they are playing a tune of
long ago
As the winter winds do blow and the darkness
gathers in.

Oh don't you cry, don't you cry
Oh don't you cry.

Come lovely Nancy and leave them all behind
The richman and the blind who are beating at
your door
Hands that would steal you are reaching for a
child
And the winter night is wild Oh it's time for
you to leave.

Oh don't you grieve, don't you grieve
Oh don't you grieve.

The crooked faces in the street are marching
to the drum
That beats in time to the dancing feet it's time
for you to run
The drunken shadows in the rain are rolling to
the war
And faces at the window pane are crying ever
more.
Come lovely Nancy and take me by the hand
And I'll tell you if I can that your eyes are
growing cold
The pipes they are playing a tune of long ago
As the winter winds do blow and the darkness
closes in.

Oh don't you cry, don't you cry
Oh don't you cry.

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WHEN WINTER WALKS

When winter walks upon the hill
And stands within this place
Then I will come to you again
To look upon your face
To look upon your face.

Within the bounds of this poor time
Your visions men despise
With words of magic, words of rhyme
They will bind your eyes
Oh they will bind your eyes.

For many follow after you
In field and forest green
Along the roads along the years
So quickly flows the stream
So quickly flows the stream.

And men shall stand within your hall
As legend did foretell
With words of wonder, words of night
They will cast a spell
Oh they will cast a spell.

When flower has turned to flame of gold
And winter winds do blow
Then I will lay me down to rest
Within the fire's glow
Within the fire's glow.

ROSES

Red, White, Black is the day
That colours the sword and the jewel
And England's despair that her flowers so fair
Should be crossed in a war so cruel.

Red is the rose of the Lancaster King
A colour of passion and fire
But red is the blood that pours in a flood
From hearts filled with greed and desire.

White is the Yorkist rose, white as the snow
A flower so pure and so holy
But white is the shroud that covers the proud
And the headstone that covers the lowly.

Figure III. Part of a cassette inlay, showing narrow type

Summing up

The rumour that this software has been two years in the making is credible. A lot of thought has evidently gone into its philosophy and execution, and it is above all fast and powerful. As ever, of course, you may feel the jury should stay out until the other awaited programs are completed, but Impression is much the better of the two DTP packages available now, even without the graphics element.

CLARES
KNOWLEDGE
(or·gan·is·er)
the ability to store information and cross reference at the touch of a button.
SEARCH
ACCESS
DISPLAY
Text Filing System

the ability to store *information* and *access it* at the touch of a button.

Knowledge organisation. It sounds so easy, but it's surprising how difficult it is. Compiling files, data, research, even the novel that (so the theologians say) is in all of us.

Now, however, thanks to a new program from Clares "Knowledge Organiser", all that has now become very simple. It files downloaded summary data with the ability to tailor files precisely to suit any speciality. Biographers can export every note typed into the word-processor for consultation or incorporation in the final work. Doctors can add on line data to existing stored knowledge allowing them to stay ahead in a rapidly changing field. Yuppies, throw away your personal organiser, get a Knowledge Organiser.

Lawyers, Historians, Writers, Lecturers, Scientists, Students, Z88 users, everyone who needs to organise, collect, collate and create will benefit from this revolutionary new program.

It's like having a spare mind at your disposal, and as the saying goes—*two heads are always better than one.*

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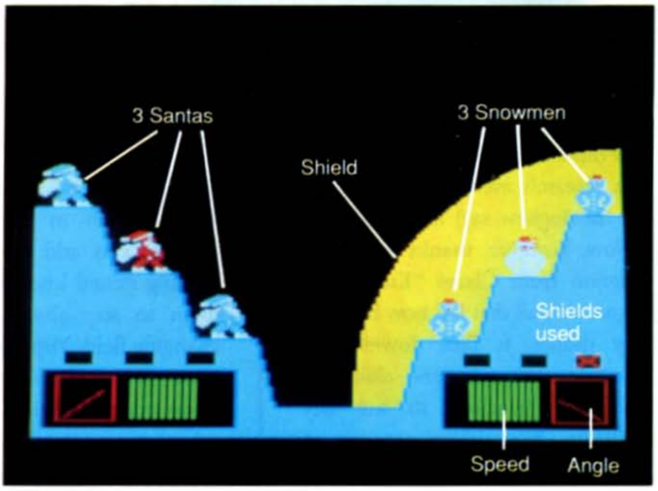

3 Santas
3 Snowmen
Shield
Shields used
Speed
Angle

REVENGE OF THE SNOWMEN

Jon Perry and Pali Rao invite you to fight it out with Father Christmas

THE time-honoured and traditional pastime of Santa – after delivering all his presents at Yuletide – is playing the Snowman at Advanced Noughts and Crosses. But this year everything just seemed to go wrong... After a particularly hard day Santa was in a grumpy mood. After losing for the fourth time in a row, he jumped up, knocked over the board and accused the Snowman of cheating.

The Snowman protested his innocence but Santa would only be satisfied with a duel to settle the matter. They each went to one side of the cliffs of Arhey and, being very adept at magic, replicated themselves three times each. The magical images would then throw snowballs across the chasm – each image being destroyed by the slightest touch, but each side had the added protection of three magical shields which stopped oncoming snowballs.

Each side has five keys, controlling a snowball's angle and velocity, the position of the image which will throw it, the shield and fire. However, you can't activate the shield while your own snowball is in the air.

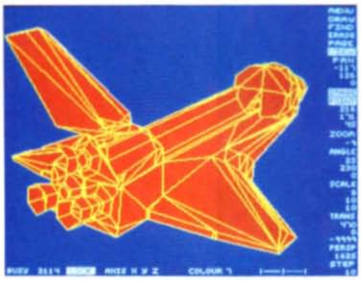
Dare you take sides and fight for the honour of the Snowman? Or protect Santa from his own embarrassment? Only you – with a friend – can settle the issue.

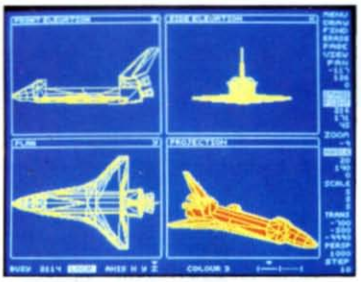
Turn to Page 108 ▶

SILICON VISION

SOFTWARE FOR THE ARCHIMEDES & BBC

SolidCAD





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REALTIME SOLIDS MODELLER

The package includes both the sophisticated design environment of SolidCAD and the high speed animation capability of a Realtime Graphics Language (RGL) module developed in pure ARM Risc code for supercharged performance. The package is ideal for Architectural design, Interior design, Engineering design & teaching CDT. The RGL module can be used to create standalone flicker-free animation of designs from your own programs. Smooth shading is also performed for realistic images. Through our in-house expertise in 3D Design and High-speed techniques, no other package can rival the design environment & animation speed of the Realtime Solids Modeller.

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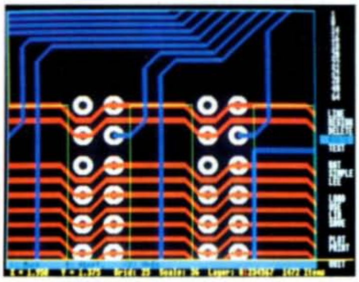

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Your technical questions answered by MIKE COOK

PROBLEM SOLVED

On the agenda...

- When Wordwise won't work
- Intermittent BBC Micro crashes
- Disc loading difficulties
- Illuminating a keyboard LED
- Converting Atari-type joysticks

Random crashes

MY issue 7 BBC Micro has lived a happy life until recently when it started to crash occasionally. The fault was diagnosed by Watford Electronics as being hot ram chips, which were eventually replaced. The problem recurred at first but was corrected.

Recently I upgraded to a sideways rom board, also from Watford, to accommodate their MkII 1.54T DDFS rom, Basic, Disc Doctor, Edword, Dumpout 3 and Replay roms. I bought their Quest Paint software and the problem surfaced again.

I'd switch on the micro and load the software. It would either crash after 15 to 30 minutes or hang up when I tried to enter the I/O menu, causing the art drawn to be corrupted. During Basic programming, while not using Quest Paint, the micro would again hang up, and, for instance, the I/O menu would appear corrupted when a program was listed.

The micro was again sent to Watford Electronics for repair, and at first the staff couldn't find anything wrong. Showing them Quest Paint being used until it crashed changed their minds and the micro was returned, again apparently fixed, with a brand new motherboard.

The problem had, it seemed, been cured. However, a few weeks later it returned and I've resorted to using the micro without Quest Paint plugged in and haven't had any problems.

I would like to know whether my micro has seen the last of its days or whether the Quest Paint chip is faulty, considering the fact that it also crashed on a second BBC issue 7. Although this is rather a long-winded problem I'm desperate for an answer as I am considering buying Watford's Wapping Editor package and want to know the chances of this crashing on me. – **Roderick Forsythe, Brentwood, Essex.**

● *The problem with many descriptions of faults like yours is that they lack any technical information. I am not sure what I can do by letter that Watford has not been able to do with extensive hands-on experience.*

It is notoriously difficult to track down an intermittent fault and it is doubtful whether removing your Quest Paint chip has really performed a cure. Replacing the motherboard does not leave many things that could still be wrong with your machine.

It is very remotely possible that there is an intermittent fault on the rom itself causing it to stop working, in which case a replacement might be a cure. If your micro continues to work correctly without this rom then it is worth a try. I am afraid there is no way of predicting whether you will get trouble with any other package.

Reluctant Repton

I OWN a 32k BBC Micro with OS1.2 and Acorn DFS and have recently bought Repton Infinity from Superior Software via Impact Software. When I received the discs I inserted the appropriate side of the games disc in the drive and loaded it. The screen went blank and there were a few noises from the drive, but not the usual loading sound.

I pressed Break and started again. This time the micro reported the error message *Disc Fault at 00/0E*. I assumed the disc had been bent in the post so I sent it back. I received a letter from Impact Software saying that the game had worked perfectly on their micro and they gave me a credit note.

Thinking that there may have been something wrong with my micro I took a look inside. As I did so it occurred to me that my Wordwise chip may have clashed with the game. I removed the chip and with the credit note I had received from Impact Software bought the game again.

I inserted the disc in the drive as before and tried to load it. Exactly the same thing happened. First time the blank screen, second time the disc fault. Please could you tell me what to do as I have heard that Repton Infinity is a brilliant game and I would like to own a working copy of it. – **Richard O'Brien, Cwmbran, Gwent.**

● *As you have discovered, the fault is nothing to do with your Wordwise chip. Unfortunately, you do not give me much information to go on. For example, do you have any problem loading other protected games? Have you tried the disc on a friend's machine?*

The error message Disc Fault means that the

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micro has failed to find the correct information, the numbers following it indicate the track and sector where the error occurred.

The strange noise from the drives suggests that the disc head was hunting for the correct track, failing and then retrying. This suggests a mismatch in the track capacity between the disc and drive or a badly aligned drive head.

Problems beget problems

I HAVE had my BBC B issue 7 since 1983 and until recently, when I added a Watford DDFS, Wordwise Plus and Quest Mouse Package, it had been unexpanded.

Since these additions I have noticed that the machine runs hot – maybe because the drives are powered by the micro – and sometimes weird characters appear on screen of their own accord.

This has not bothered me too much but recently, after pressing Break, the drives did not respond to !Boot and the keyboard hung up. I turned the machine off, but found that it would not turn back on. All I could get was one long tone with beeps and buzzes in the background. I tried pressing all the keys, including Control+Break, but nothing worked.

Eventually I removed the lid and poked around inside, pushing on various chips and the keyboard connector. When it was turned on again the micro functioned normally, with the start-up message and so on, but although the Caps Lock function worked OK the small LED indicating it did not.

It has obviously blown or shorted out. Will an ordinary LED do or must I replace it with a special kind? Is it just coincidence that these two malfunctions occurred, or did one spark the other off? – **Tim Boughton, Harrogate, North Yorkshire.**

●*I think there is a simple solution to this. You may not have been careful to make sure that the LED was lined up with the hole in the lid and it has been bent down so you are not seeing it through the hole. Alternatively, the soldered joint where the LED joins the circuit may have been broken.*

LEDs are very difficult to blow like this but if it is faulty any one will work in its place. Your original problem was probably just a loose keyboard connection.

Cheaper circuit

In the September 1989's Problem Solved you gave a method to connect an Atari-type joystick. Here's an alternative method of doing it.

The circuit below allows any Atari-type common earth switched joystick to be connected to a BBC Micro. This costs less than a pound to make – not including connectors – and so is a lot cheaper than the solution given.

Components: R1, 2, 4, 5 – 56k. R3, 6 – 33k. TR1, 2 – ZTX 500, or any similar PNP transistor.

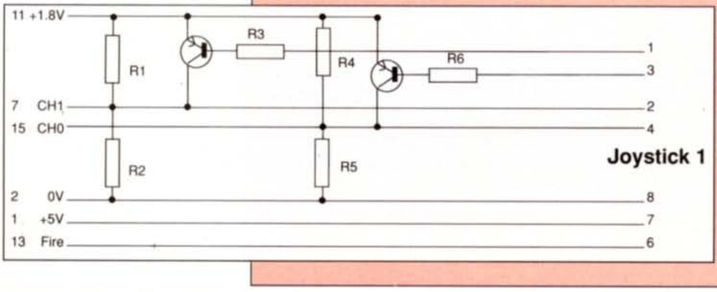
Also required: 9 pin D-type plug and a 15 pin D-type plug.

The pin connectors for the Atari style Quickshot 2 are:

1 – Up
2 – Down
3 – Left
4 – Right
5 – Not used
6 – Fire
7 – + 5V
8 – 0V
9 – Not used

– **G. Clarke, Knock, Belfast.**

●*This circuit will work out fine. Remember my solution was not designed for a common earth joystick but for a Tracker ball. You will note that the connectors are the most expensive part of the interface.*



Wise to Wordwise

I SEE that you answer some pretty tricky hardware questions in your Problem Solved column, so I wondered if you could solve the one on my second-hand BBC B. I need it for word processing, but I can't get my Wordwise Plus to work, so the micro has lain virtually idle since the beginning of the year.

The problem that baffled me may sound simple: Having plugged the chip into the BBC Micro board, the words Wordwise Plus come up on screen but nothing further can be done with it.

I initially blamed the Wordwise Plus chip but I tried it on another BBC Micro and it worked perfectly. However, it still won't work on mine.

I don't know how relevant this might be to a diagnosis, but I know that for some reason numerous chips were removed from their sockets but they all appear to be in their correct positions. Could you suggest a course of action which might locate the problem described?

Also could you please let me know if you have a Z88 program giving sidereal time from mean time for astronomical purposes. If you have I would be very interested in using it. In recent issues I did not notice any programs specifically for the Z88, but hope to see more eventually. – **Tony Thomson, Glasgow.**

●*There could be a fault in the rom socket or a crack in the track on one of the higher order address lines. This could cause the system to start running but crash once it reached a certain part of the program.*

As to your astronomical question, in the April 1988 issue of The Micro User was a program to find the coordinates of stars and update them in real time. This included a procedure for converting GMT into sidereal time.

Although we no longer publish articles for the Z88, many of the shorter text-only routines in The Micro User *will work on the portable micro with little or no modification.*

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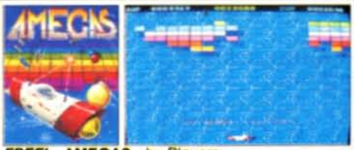
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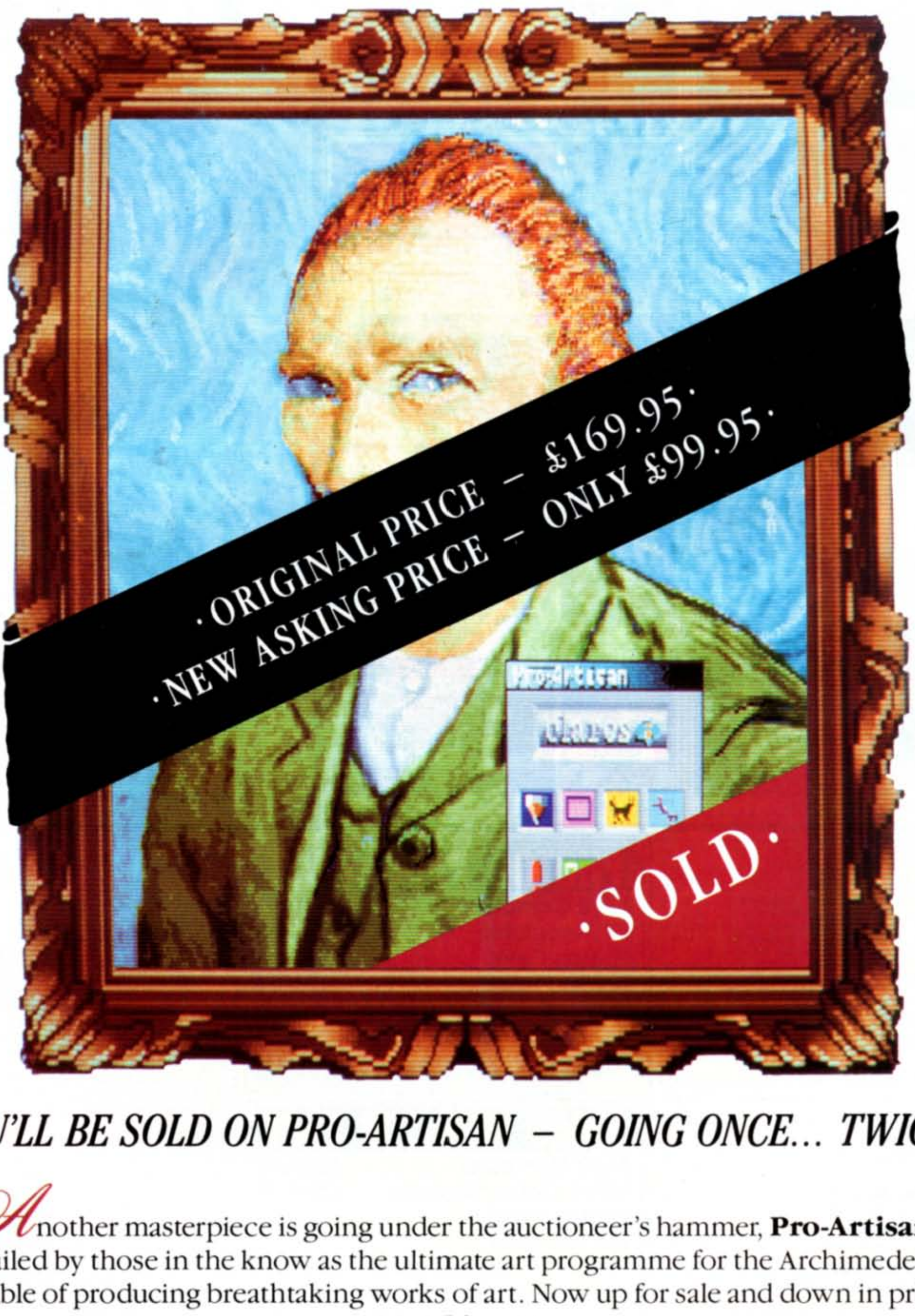
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Signs of the times

Bruce Goatly finds that big really is beautiful

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WHEN my history master wanted the class to remember a particularly important point he would tell us to write it in letters of fire six feet high. We never did, of course, because none of us were that clever, but if Signwriter had been around at the time we might have coped with printing it in letters one foot high.

For a couple of years this natty software has been enabling owners of PCs and the 8 bit BBC Micros to print displays of text, logos and symbols in a variety of styles and sizes, and now the Archimedes version is available.

The programs come on one 3.5in disc, and the documentation consists of the 36 page manual for the PC version plus several A4 sheets of supplementary notes for the Archimedes edition. This is one of many manifestations of the software's PC ancestry – it uses no windows and makes minimal use of the mouse.

After setting up the two working discs, which the notes explain the Arthur way rather than from the Risc OS desktop, there are three main things you can do – input a sign, print a sign and design or edit a font.

The first allows you to lay out a sign from scratch; alternatively you can alter an existing one or read in a word processed file. A sign can be made to print horizontally or vertically, and a ruled box can be printed round it.

Text is handled a line at a time, and after each you are prompted to enter its size, position and other aspects before continuing. Predesigned signs and logos can also be specified and characters whose position numbers in the font are outside the keyboard range are easily entered.

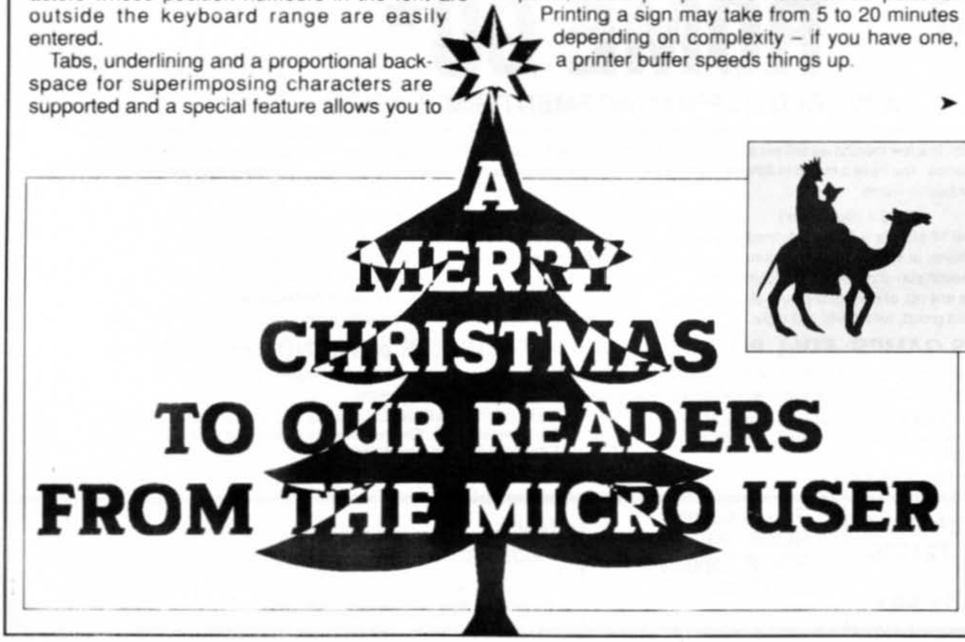
Tabs, underlining and a proportional backspace for superimposing characters are supported and a special feature allows you to have more than one type style in a sign by effectively joining fonts end to end.

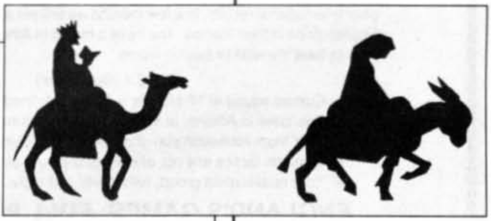
The program guides you through what is really quite a complex job in a competent and businesslike way. The many options offered may seem daunting at first, but on-screen help is available and after a little trial and error it all soon falls into place.

The finished sign is stored on disc ready for printing by the second program. This requires three other files to be in the same directory – Settings, containing printer codes in text form, Fastfont and Spacing, which contain the font information in a precalculated form. Several Settings files are provided for different printer types and they are self-documenting if you need to alter them.

Once you have set printing in motion there is an initial delay for calculations. After this the speed of printing is impressive considering the work involved and the fact that most of the program is in Basic, with only some Arm code. On 24 pin printers each printed line takes only one pass, but 9 pin printers need three passes. Printing a sign may take from 5 to 20 minutes depending on complexity – if you have one, a printer buffer speeds things up.

➤





Overlaying fonts and symbols is easy

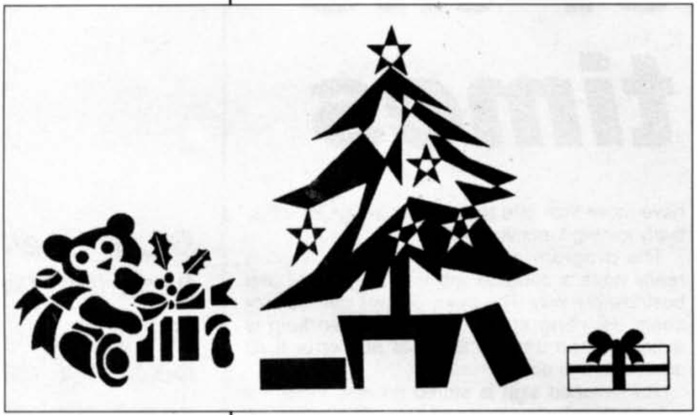
➤

The third and most complicated program is the font designer, and even the manual doesn't pretend that it is easy to use. This is understandable given that Signwriter characters are drawn and stored as outlines rather than dot patterns, which actually makes the letter shapes smoother the bigger they are printed.

The principle of drawing a letter is to build it up with points that define adjoining straight lines and smooth curves. There are three mathematical rules governing your choice of points but the program works them out for you and won't let you enter illegal points, which is easy to do unwittingly.

Other possibilities include inverting, rotating, mirroring, slanting and filling a letter – useful for discovering gaps in the outline – and various advanced options exist, for instance optimising the point sequences.

The documentation includes ReadMe files on disc – it is extensive and, once you have found it all, highly informative. But its scattered nature means you may spend some time absorbing it. A single, Archimedes specific manual is called for because reading the PC manual first and then the Archimedes notes is unnecessarily confusing and frustrating.



Words or shapes are all easy with Signmaster

Summing up

This is a well thought out package that makes it easy to produce high quality results. There are many strong features and it is worth getting to grips with. The two niggles are the lack of a proper manual and the pre-Risc OS operation, especially for file loading and saving. And be warned – printing signs, though enjoyable, uses ribbons up fast.

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Colourful

Mike Cook presents the first part of a project to enhance your 8 bit display

THE BEEB BODY BUILDING COURSE

I THOUGHT we would have a colourful start to a new decade and look at a project – the Chameleon – that will give the BBC B or Master some of the extra colours enjoyed by owners of 32 bit machines. With the Archimedes you can choose the displayed colours and shades from a palette of 4,096. Using the Chameleon colour palette you can now have that choice on any BBC Micro.

This is a great improvement on the garish primary and secondary colours normally displayed, although the number of different ones shown at any one time is still the same, depending on the graphics mode being used. Mode 2 offers the maximum of eight. Using the Chameleon those colours can be defined exactly as you want – even with Mode 7.

Because you have total control over the colours displayed, graphic displays become more realistic, charts and graphs can be more meaningful and the whole screen layout may be made to harmonise instead of clash. This will considerably reduce operator fatigue as the colours chosen should be restful for the eyes.

The Chameleon plugs into the user port of the BBC Micro and uses the following pins:	
CB1	Unused
CB2	Latch strobe
DB0	Bit 0 of colour amount or colour address
DB1	Bit 1 of colour amount or colour address
DB2	Bit 2 of colour amount or colour address
DB3	Bit 3 of colour amount or main/alternate palette access
DB4	Unused
DB5	Video access/ program access to memory

DB7	DB6	Access
1	1	RGB and main/alternate palette display: Fed to look up ram and enables writing to the colour number latch
1	0	Access to blue colour value look up ram
0	1	Access to green colour value look up ram
0	0	Access to red colour value look up ram

Table I: Programming the Chameleon

Well how can we do this trick? First we need an analogue RGB monitor – the type used on the Archimedes – which will allow the three guns – red, green and blue – to be turned on progressively instead of the simple on/off control with the normal TTL monitor. Then we need a way of turning the logical TTL RGB signals from the BBC Micro into analogue quantities.

We forget that the three logic signals of the RGB output mean anything to do with the colour, and just look at them as logic signals. This means that at any instant they will be in one of eight possible states. Now we use this signal to address a fast memory which can have as many bits per address as we want.

If, for example, we have 12 bits per address we can have four bits devoted to each of the three guns. If we feed them to a digital to analogue converter we can get the proportional signal to drive an analogue monitor. This means that the colour displayed depends on the memory contents. The address is known as the logical colour and the contents is known as the display colour.

We also have to program this fast memory, so we need to switch the memory address from the RGB output to a micro output. Figure I shows the basic block diagram of a palette of this type.

Unfortunately, such a simple arrangement will not work with the BBC Micro as we don't have enough outputs, so we have to resort to a bit of trickery to squeeze the control information on to the user port. This is done with the aid of a latch and decoder as shown in Figure II. We can use bits 0 to 3 to supply the address of the memory and hold that in a latch. Then we can use these same four bits to enter data into one of three memories.

As they are being addressed by the same lines we can consider each as containing one third of the number. This is very convenient, as they can be thought of as red, green and blue memories. These numbers are clocked into the latch or memories by the strobe signal or pulse that can be generated on control line 2 of the VIA. Bits 6 and 7 of the user port control where this pulse goes – this is done by using a decoder. The user port bit allocation is summarised in Table 1.

The practical circuit is shown in Figure III: The memory is made from three 74LS189 16 x 4 bit memory chips. The latch is a 74LS175 and the decoder uses half of a 74LS155 – unfortunately the other half goes to waste in this circuit. Finally the 74LS158 is the switch to the address lines. A 74LS157 (inverting switch) would do equally as well, as it does not matter which way round the address lines are.

The digital to analogue converter simply con-

Chameleon

sists of a weighted resistor network. If we use one per cent resistors there is enough accuracy for four bits. To get the exact values we want, the two least significant bits are weighted using two resistors and the summing junction is fed into the base of a PNP transistor acting as an emitter follower. This gives an analogue signal relative to the 5 volt line; the final NPN transistor turns it the right way round again.

All the parts are available as Body Build Pack 56 including a double-sided, plated through hole printed circuit board. This does not have a component reference printed on but there is an accompanying sheet showing the locations. For those of you not using the kit you need to add three 0.1uF capacitors to the power lines to the ICs – these are omitted from the diagram for clarity's sake. You also need a standard 20 way

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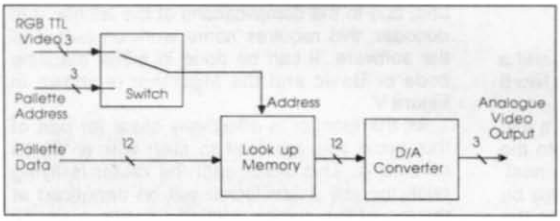

RGB TTL
Video 3
3
Pallette
Address
Switch
Address
Pallette
Data
12
Look up
Memory
12
D/A
Converter
3
Analogue
Video
Output

Figure I: A simple colour pallette

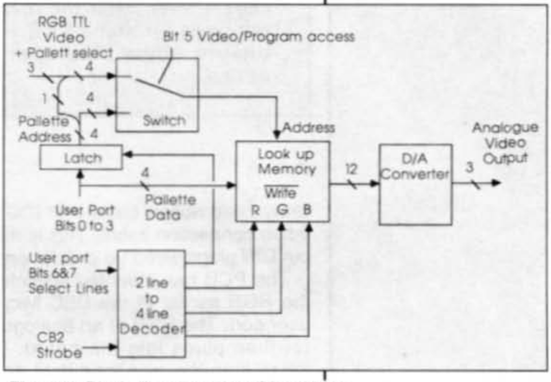

RGB TTL
Video
+ Pallett select
Bit 5 Video/Program access
3
4
1
4
Switch
Pallette
Address
4
Latch
4
Pallette
Data
User Port
Bits 0 to 3
Address
Look up
Memory
Write
R G B
12
D/A
Converter
3
Analogue
Video
Output
User port
Bits 6&7
Select Lines
2 line
to
4 line
Decoder
CB2
Strobe

Figure II: Block diagram of the Chameleon

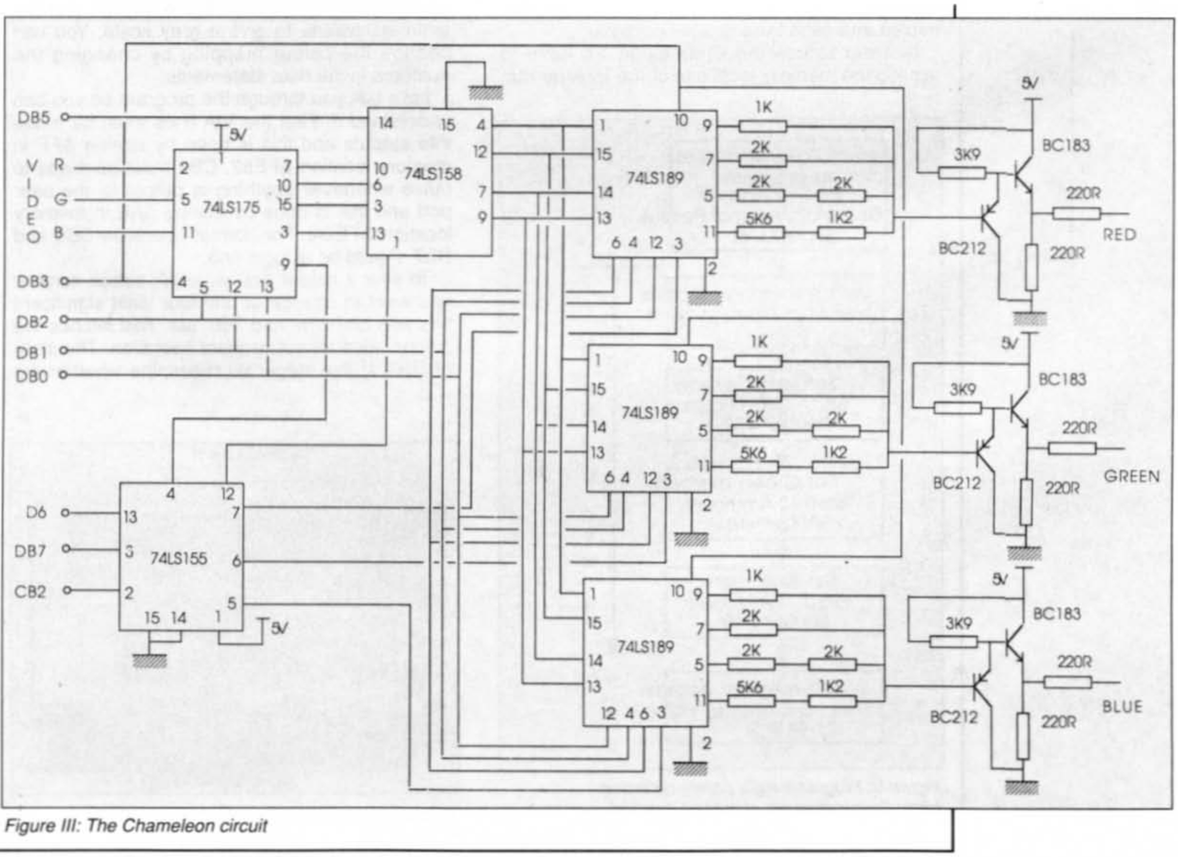

DB5
VIDEO
R
G
B
DB3
DB2
DB1
DB0
74LS175
74LS158
74LS189
74LS189
74LS189
5V
D6
DB7
CB2
74LS155
1K
2K
2K
2K
5K6
1K2
3K9
BC183
BC212
220R
220R
RED
GREEN
BLUE

Figure III: The Chameleon circuit

Suitable Monitors

The BBC Micro normally demands a colour monitor with a digital input. But in order to use the Chameleon, you must have an analogue RGB unit. Many, like my Electrohome, are suitable for analogue or digital input. In addition some digital ones can be changed to an analogue input.

For example, one MicroVitec colour monitor has several links inside that allow you or your dealer to change it to an analogue input. If you remove the panel at the back of the monitor you should see them. The settings are shown in Figure IV. If you do not see them ask your dealer about the availability of a modification.

As there are high voltages inside a monitor case – even after the mains plug has been removed for some time – **if you are at all unsure about this operation get expert advice.**

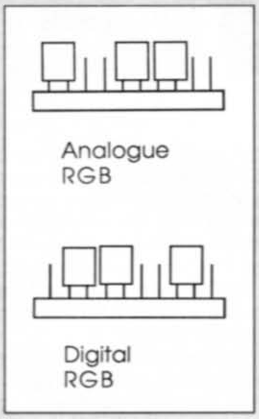

Analogue
RGB
Digital
RGB

Figure IV: Links to change the Microvitec monitor

➤

Body Build ribbon cable with IDC sockets and a video connection cable. This is made with two 6 pin DIN plugs wired up *one for one.*

The PCB has mounted sockets to plug it into the RGB socket of the BBC Micro and into the user port. The RGB of an analogue colour monitor then plugs into the board. Power can be taken from the monitor output so that once the Chameleon has been programmed with the required colours the user port may be disconnected and used for any other purpose.

In order to use the Chameleon we have to access the memory locations of the look-up ram and, due to the complications of the latches and decoder, this requires some work on behalf of the software. It can be done in either machine code or Basic and the algorithm is shown in Figure V.

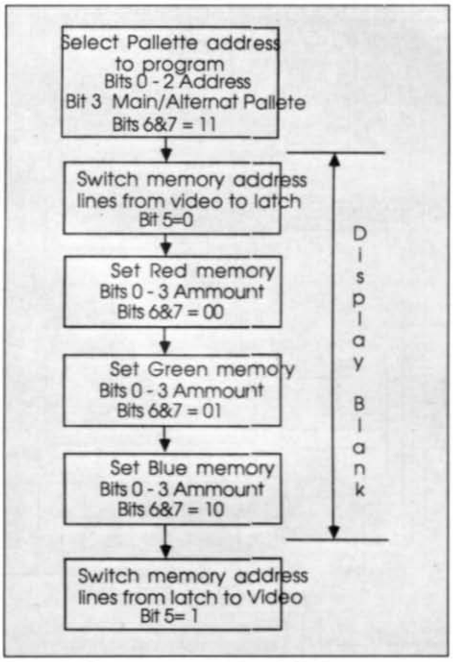

Select Pallette address to program
Bits 0 - 2 Address
Bit 3 Main/Alternat Pallete
Bits 6&7 = 11
Switch memory address lines from video to latch
Bit 5=0
Set Red memory
Bits 0 - 3 Ammount
Bits 6&7 = 00
Set Green memory
Bits 0 - 3 Ammount
Bits 6&7 = 01
Set Blue memory
Bits 0 - 3 Ammount
Bits 6&7 = 10
Switch memory address lines from latch to Video
Bit 5= 1
Display Blank

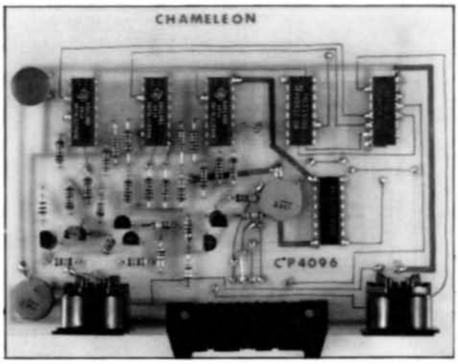
Figure V: Programming a pallete definition
Note: Colour amounts should be inverted

As the monitor is effectively blank for part of this cycle you are best to start with a *FX19 command. This waits until the raster is flying back, so any slight flicker will be unnoticed at the top of the screen. Listing I shows a simple Basic program to initialise the main palette to produce the normal BBC Micro colours and the alternate palette to give a grey scale. You can change the colour mapping by changing the numbers in the data statements.

Let's talk you through the program so you can understand it. First the VIA lines must be made into outputs and this is done by storing &FF in memory location &FE62. CB2 must be made to pulse whenever anything is output to the user port and this is done by storing &AE in memory location &FE6C. For normal operation DB6 and DB7 should be at logic one.

To alter a colour, first write the colour number you want to change on the four least significant bits with bits DB6 and DB7 set. This latches the colour value for subsequent operation. The state of DB3 at this stage will determine whether the

➤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CP4096

An assembled Chameleon viewed from above

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colour number is in the main or alternate palette.

Then write the three colour values on the four least significant bits with DB6 set for the green component or DB7 set for the blue component of the colour. With neither set you will alter the red component. Note that these values should be inverted – write 0 for maximum amount of colour and 15 for none of that colour.

Finally return the Chameleon to its normal state by storing &E0 at the user port for the main palette or &C0 for the alternate one. During this sequence the input of the look-up ram will be fed from the micro and not the video lines, so the Chameleon will not produce any video output. If for any reason the sequence is not completed the monitor will be blank.

On switch on the memory will contain random values. This will produce a strange mapping of colours and might not be readable until you run Listing I. As an alternative there is an optional initialisation rom to program the Chameleon to the default automatically on power up.

As the memories used are 16 x 4 – for Mode 2 we only require 8 x 4 – we can use the other half to define a so-called alternate palette. We can switch between this and the main palette instantly by changing bit 3 in the address latch using the Basic command:

```
?&FE62=&FF:?&FE60=&C0
```

To revert to the main palette use:

```
?&FE60=&E0.
```

You can change the backgound colour – 0 – but note that this affects the appearance of the others. This is a trick played by the eye and not by the Chameleon. Occasionally, however, a particular type of monitor might object to this and produce some distortion. When this happens it is because the monitor is performing black level clamping on the video signal.

The effect will be that instead of the background altering it will stay black and all the other colours will change. The solution is to apply frame and line blanking signals to the video signals between the Chameleon and the monitor. This can be done with most mixing consoles or signal processing units. However, if you do not have access to these and experience this difficulty, keep the change in background colour small or use the VDU 19 command to change the background colour and keep colour 0 defined as black.

Remember that the Chameleon changes the display colours on the BBC Micro, so the display colours as defined by the VDU 19 statement act in the same way as the logical colours did. Note also that you can use flashing colours with the Chameleon. As each colour can be precisely defined you are not restricted to flashing a colour and its complement, they can be any two that you have defined.

● *There is a lot more to handling colours than shown in Listing I, so next month we will explore how to get the most out of the Chameleon. Have a happy and colourful New Year.*

```
   10 PRINT"Chameleon Initialisation"
   20 PRINT"Using Basic"
   30 PRINT"By Mike Cook"
   40 ?&FE62=&FF
   50 ?&FE60=&E0
   60 ?&FE6C=&AE
   70 PRINT
   80 RESTORE 150
   90 FOR A=0 TO 15
  100 READ R,G,B
  110 PROCPROGCOL(A,R,G,B)
  120 NEXT
  130 REM Numbers in groups of 3 each Re
d Green & Blue values
  140 REM For main palette
  150 DATA 0,0,0, 15,0,0, 0,15,0, 15,15,
0
  160 DATA 0,0,15, 15,0,15, 0,15,15, 15,
15,15
  170 REM For alternative palette
  180 DATA 0,0,0, 2,2,2, 4,4,4, 6,6,6
  190 DATA 8,8,8, 10,10,10, 12,12,12, 14
,14,14
  200 PRINT"Done"
  210 END
  220 DEF PROCPROGCOL(CN%,R%,G%,B%)
  230 ?&FE60=CN%+&E0
  240 *FX19
  250 ?&FE60=R% EOR 15
  260 ?&FE60=(G% EOR 15)+64
  270 ?&FE60=(B% EOR 15)+128
  280 ?&FE60=&E0
  290 ENDPROC
```

Listing I

Get it right!

```
 10 = C1A3 3 | 110 = C6C1 0 | 210 = FD2E 3
 20 = C925 8 | 120 = 2C83 7 | 220 = 89E8 3
 30 = FC23 7 | 130 =    0 7 | 230 = 5E0E C
 40 = 906F 6 | 140 =    0 7 | 240 = 61AE 3
 50 = 9FEE 8 | 150 = BE5C 9 | 250 = 5160 2
 60 = 8E4C 8 | 160 = 5825 D | 260 = E9A1 8
 70 = FF3E 1 | 170 =    0 D | 270 = 5BCB E
 80 = 5DE2 F | 180 = E2D2 A | 280 = 9FEE 5
 90 = 3E2A 6 | 190 =  3B7 8 | 290 = ED0F 9
100 = 58EF 9 | 200 = 4C76 2 |
```

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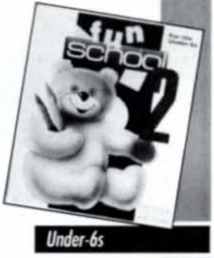

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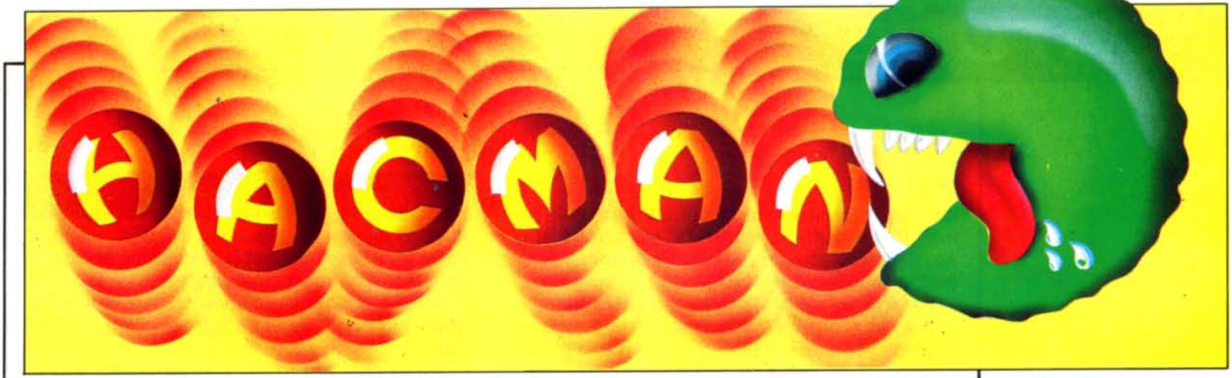


Keys to monster success

Hac Man reads what's on the cards for BBC Micro arcade addicts

Featuring:

- Last Ninja 2
- Moonraider
- Gunsmoke
- Starquake
- Ricochet
- Repton 3
- Tetris

WELCOME to the new decade, not only for this column, but also for that amazingly long-lived beastie, the BBC Micro itself. Long may it prosper. Now let's press on with the news without further ado.

Long-established BBC Micro software house Superior had a number of new games lined up for release around the festive period – you can read a review of ***Play It Again Sam 11*** in our last issue.

One of the games on this compilation is **Monsters**: Like Software Invasion's Gunsmoke – featured later in this article – I found the playing keys chosen for Monsters not particularly to my liking. They are Z, X, * and ?, for left, right, up and down – OK so far, but D to dig and F to fill? Easy to remember certainly, but not very easy to use.

As soon as I had redefined these keys to my preferred Return to dig and Shift to fill, I began to enjoy it much more and my high score increased accordingly. Although Superior's policy regarding compilation versions is to modify them as little as possible, Superior's Steve Hanson agreed that D and F were a little awkward to use, so we may see Monsters re-released with different playing keys.

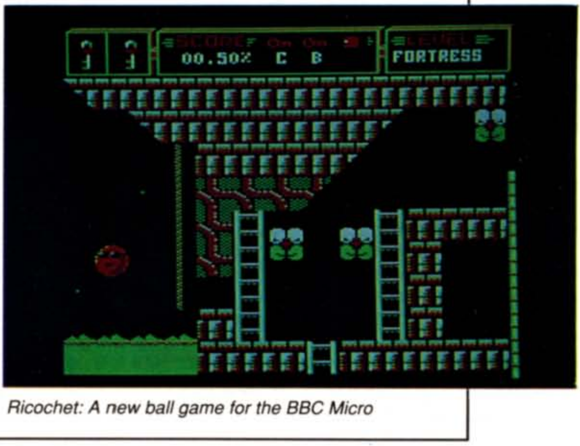
Superior's other new releases are designed to appeal to a wide range of players. First off the line is **Ricochet**, a Marble Madness-style game which features "a cleverly-animated squashy ball", to quote Steve Hanson. Its main feature is the speed at which everything moves – certainly not the sluggish gait that sometimes associates with a lot of complicated graphics. There are 375 screens spread over five playing levels – of which 330 are entirely different – 25 baddies and 45 puzzles that must be solved along the way.

The five levels are Fortress, Techlev, Derelict, The UFO and Ancient, which gives an idea of their design and graphical appearances. I have not as yet seen it, but it sounds rather like Bobby Bearing which appeared for a number of other machines, but sadly not for the BBC Micro.

The second offering should appeal to all armchair Ninja. To follow the enormously-successful Last Ninja, Superior has now secured the rights to its successor, the imaginatively-titled **Last Ninja 2**. Like its precursor, the new game is being coded by Peter Scott which should make it something to look forward to. Superior is not supplying the plastic shirukan star and Ninja mask for which System 3, the original publishers, charged extra.

Third out of the bag is **Perplexity**, described as a sort of 3-D Pacman crossed with Repton-style puzzles and strategy. As I count myself a great fan of games such as Repton that com-

➤



Ricochet: A new ball game for the BBC Micro

➤

bine action and strategy, but unfortunately do not have sufficient funds to afford the Archimedes necessary to play Pacmania, I can't wait to see Perplexity.

Vertigo, which will appear shortly after the above, is another Marble Madness-style game in which you guide your character around a succession of increasingly tricky landscapes presented in Knight Lore-style isometric 3D perspective. However, it differs in that you have up and down movement as well as that in the four usual directions.

Superior's next big release will be **Destiny**, an arcade adventure in the mould of Citadel and Exile. Details are sketchy at the moment, but Steve tells me that it features extremely large graphics.

Destiny should hit the shelves around March, so keep an eye out for it.

Bit of a handicap

You've all heard of Handicap Golf – how about Handicap **Tetris**? For an experienced Tetris player, the game ends only when the shapes are falling too fast to be manoeuvred into position – the limitation is physical rather than mental and the early stages of the game can be played on autopilot. Now, however, Tetris can be given a new lease on life. Walt Patterson of Amersham, Bucks, a regular contributor to this column, has informed me of the method that he has devised to revitalize this excellent game.

It is really quite simple. Start on your normal level, then press the Z key – say – six times quickly, to drop six random shapes one on top of another. Each game accordingly begins with a different initial configuration, into which you must fit subsequent falling shapes.

Although Walt recommended dropping six handicap shapes, I found. I got just enough of a challenge if I dropped only three or four straight away. However, I'm sure that everyone would come up with a different ideal handicap – try it and see. If you're really adventurous, try tapping the left and right keys as well when you drop your handicap shapes.

This tip, combined with the built-in option of starting on a particular skill level, allows almost infinite variety on the opening sequence. Thanks for that tip, Walt.

All fingers and thumbs...

Modern games have pushed the BBC Micro to limits that were probably undreamt of only a couple of years ago. Although recent offerings make some older ones show their age, a really good game will keep its appeal regardless of age.

Three that are to my mind ageless and to which I keep returning time and again are Micro Power's **Mr EE**, **Pengo** from H Soft/Watford Electronics, and **Gunsmoke** from Software Invasion, now, I think, defunct.

When I first encountered Gunsmoke I found it almost unplayable. Not until I learned how to write and modify machine code programs was I able to iron out the only serious deficiency. My problem was that I could not get on with the playing keys – A and Z to move up and down, + and * to move left and right and Shift to fire. As soon as I had redefined the keys to my preferred Z, X, *, ? and Return, my high score immediately doubled.

Type in the listing below – being particularly careful with line 150 – and save it on to one of your own blank cassettes. Insert the Gunsmoke cassette, type RUN and press Play – the game will now load with these modifications.

To define your own keys you will need a list of the BBC Micro's INKEY values. You can find one in Appendix C of the Advanced User Guide, but a number have been published elsewhere. In the accompanying listing I have represented the values as hexadecimal numbers, but in Basic programs they are often represented as negative decimal numbers. To convert, say, the negative INKEY value of the Return key (-74) to hex, type:

```
PRINT ~256-74
```

which gives the value &B6. Conversely, to convert the hex value of the Z key (&9E) to decimal negative INKEY, enter:

```
PRINT &9E-256
```

which returns the value -98. Happy redefining.

```
   10 REM Gunsmoke key redefinitions
   20 REM by Hac-Man 1989
   30 REM (C) The Micro User
   40 REM
   50 FORI%=0TO2STEP2:P%=&900:[OPT I%
   60 LDA#&AE:STA&116D:\ sound on (S)
   70 LDA#&EF:STA&117A:\ sound off (Q)
   80 LDA#&B7:STA&1193:\ up (*)
   90 LDA#&97:STA&119F:\ down (?)
  100 LDA#&9E:STA&11AB:\ left (Z)
  110 LDA#&BD:STA&11BA:\ right (X)
  120 LDA#&B6:STA&11DB:\ fire (RETURN)
  130 RTS
  140 ]:NEXT
  150 *KEY0 PAGE=&E00|MLOAD"GUNSMOKE1"|M
45END|M RUN|M LOAD"GUNSMOKE2"|M
190VDU4,28,0,2,19,1:COLOUR0:COLOUR134:END|M
RUN|M LOAD"GUNSMOKE3"|M CALL&900|M RUN|M
  160 *FX 138,0,128
```

➤

It wasn't Frak!

Ok, who spotted it? In the September 1989 column, I wrote a piece on the games I've come across that feature hidden pieces of music. The code for the music is generally written into the loader routines, and can only be accessed by loading them in ways other than the normal CHAIN"" or Shift+Break procedures. Two games that feature these concealed gems are Aardvark Software's Zalaga and Frak!

In the same issue, I also voiced my first impressions of Peter Scott's then new Ballistix, and included a screenshot of the game on the first page of that column. However, there was a minor mix-up somewhere along the way, and the Ballistix screenshot came out with the caption Frak!. Anyway, Ballistix it is, Frak! it ain't. All clear now?

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(from the electronic pen of D McNeil)

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Doctor Hac-Man's Surgery

Repton is arguably the most endearing character ever to have appeared in a BBC Micro and undoubtedly the most enduring. Mark Cavill of Leeds has written to me to say that he is stuck on quite a few screens of the original **Repton 3** game and would like to know in which issue the passwords and edit codes for Repton 3 first appeared.

Well Mark, the full set of passwords and screen editor codes for Repton 3 first appeared – together with the screen passwords for the first Repton game – in the April 1987 column.

Master Compact owner Mark Asigbetse, also from Leeds, has written to me to ask if two of his favourite BBC Micro games, **Starquake** and **Moonraider**, are available for his machine. Unfortunately Mark, neither game has ever been released on 3.5in disc for the Compact and, to be honest, I would be a little surprised if either ever were.

Starquake was originally published by Bubble Bus Software of Tonbridge, Kent, but its distribution was subsequently taken over by Database Software.

However, on neither release did the game ever appear for the Master Compact. Database Software certainly has no plans to produce a special version, and considering that it is now over two and a half years old, it seems unlikely that anyone ever will.

The position with Moonraider is somewhat similar. Originally released on cassette and 5.25in disc by Micro Power, it was re-released by Superior on the Electron version of their Play It Again Sam 5 compilation. However, Steve Hanson of Superior has informed me that Superior only has publishing rights on the Electron version of Moonraider, the rights to all other versions being held by Micro Power.

When you consider that Moonraider was originally released in 1983, and that Micro Power have not released anything since Imogen two and a half years ago, the sudden arrival of a Master Compact version of Moonraider seems rather remote.

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Score
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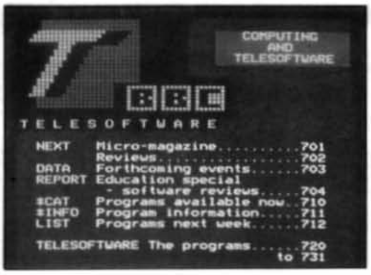

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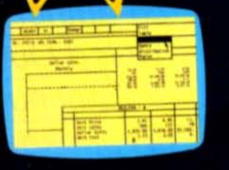

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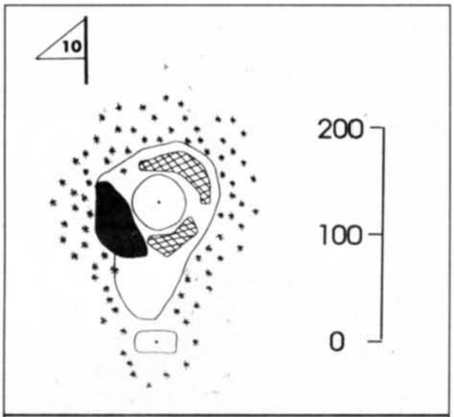
FIVE WITH

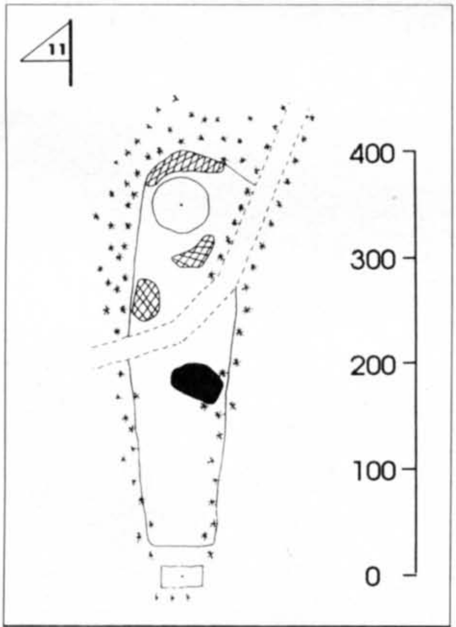
Steve Botterill, co-author of Holed Out!, continues his stroke by stroke account of his tour of Pine Islands



Hole 10 – 128 yards – par 3

There was quite a backwind, but I still gave it a fair clout with an 8 iron. It landed on the back of the green leaving a fierce left to right slope and 24 feet to putt. I didn't send it far enough to the left and it ended with 18 feet still to go. I left the next putt 3 feet short and then holed out for a bogie 4.

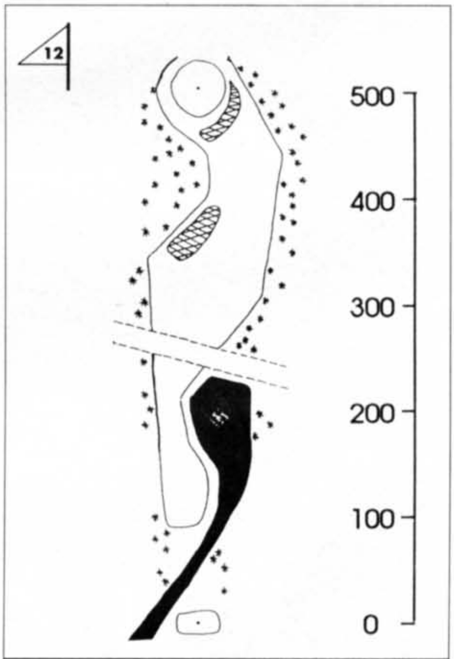
Overall 5 under.



Hole 11 – 352 yards – par 4

An 88 per cent drive to the left of the lake left me on the path. There was a strong backwind, so I decided to try a 9 iron even with 110 yards to go. The wind was also a bit left to right, so despite getting almost pin high the ball ended 15 feet to the right of the flag. An uphill putt at 25 per cent power sat on the edge of the hole and I knocked it in for a par 4.

Overall still 5 under.



Hole 12 – 501 yards – par 5

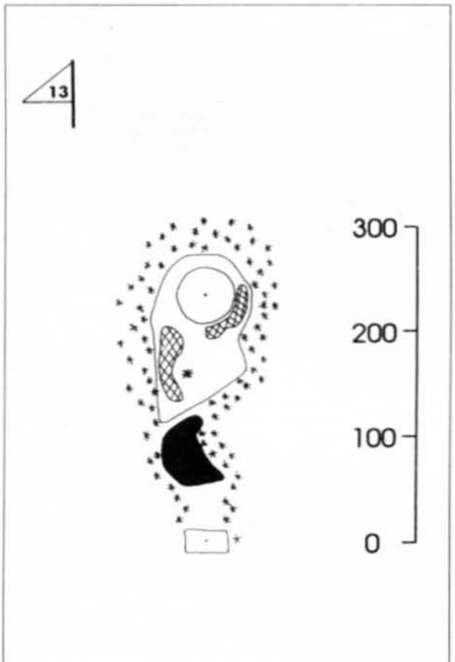
My drive could have been a lot stronger: I ended 260 yards from the flag and I couldn't see it. I'd played too far left of the water and things didn't get any better with a mis-hit 1 Wood shot landing in the bunker behind the trees with 124 yards to go.

At least it was a good lie, so I gave it a full belt over to the right with a hooked 7 iron and landed just off the green. An undramatic chip left me 27 feet from the hole and I two-putted for a bogie 6.

Overall 4 under.

HOLES BOTTERILL

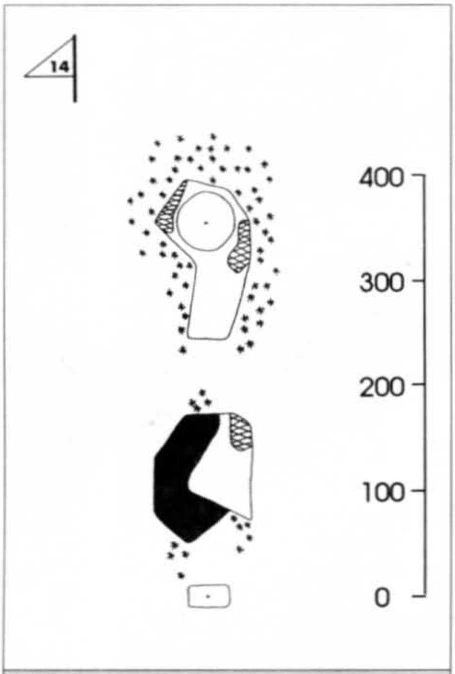
WELL, I finished last month with an overall six under par, which should be worth a jar or two at the 19th. So now let's continue the round and see if I can maintain or better this score on the next few holes.



Hole 13 – 231 yards – par 4

I've had a few holes in one here but I like a left to right wind. Unfortunately this time it was blowing the wrong way so I tried to slice it around the trees and into the wind with an full blown 3 wood. It didn't do badly, ending 12 feet from the flag. It was a steep downhill slope so I only hit it about 7 per cent and it trickled in for an eagle 2.

Overall 6 under.

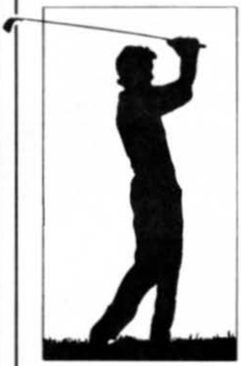


Hole 14 – 349 yards – par 4

It's about 175 yards to the large patch of rough beyond the lake so a 5 iron is my usual choice. There was a strong backwind on this occasion so I dropped down to a 6 and gave it 100 per cent. Unfortunately the wind was also blowing a little left to right and it just managed to drift into the bunker on the right and get itself plugged with 184 yards to go.

A 98 per cent whack with a 9 iron just cleared the rough leaving 107 yards to the green. I continued to use the 9 iron, which despite allowing a lot for the crosswind still left me 15 feet away with an uphill slope. The overhit putt bounced off the hole and I holed out for a bogie 5. It could have been worse, I suppose.

Overall 5 under.



Well, that's all I've got time for at the moment. I must say, I think I'm doing quite well. Join me next month for the last four holes and see if I can keep up the standard

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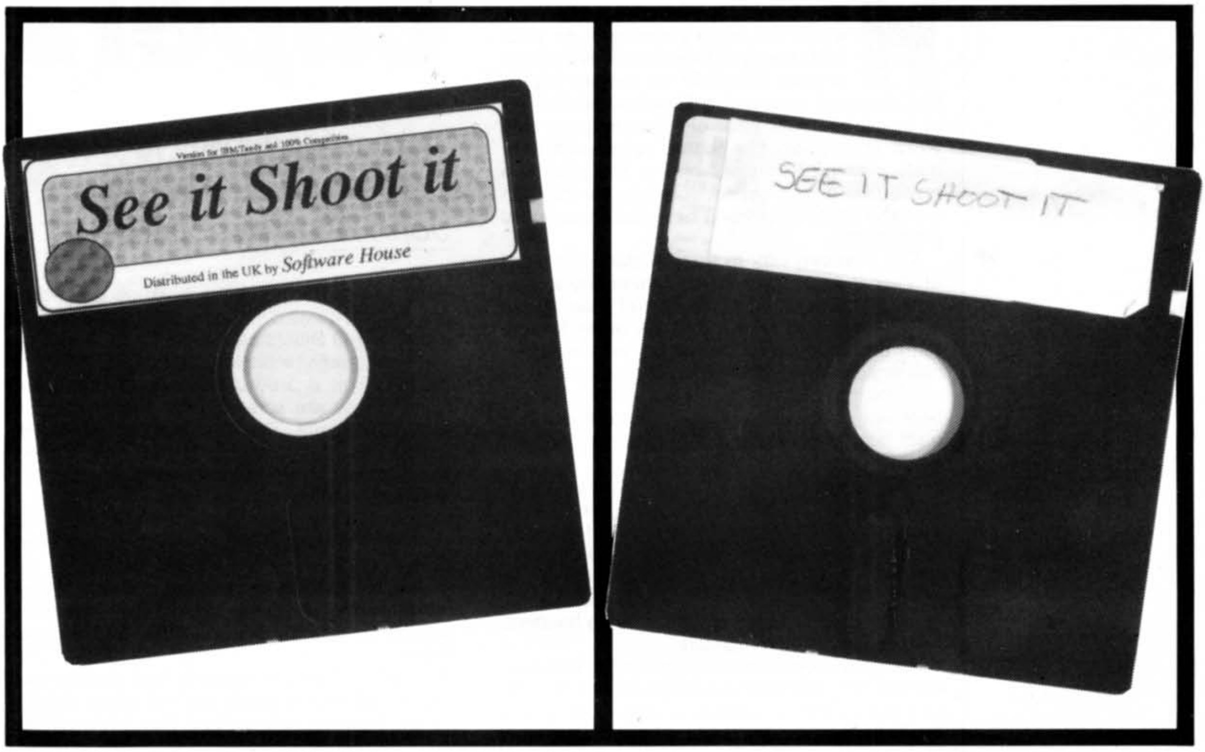
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Conversion capers

Add compatibility to word processed files using John Allen's routines

HOW often have you been given a disc full of files written using View, when the word processor on your BBC Micro is Inter-Word, Wordwise or Mini Office II? Or maybe you've just changed from using View and would like to be able to edit your old files in your new word processor. The listing presented here makes doing this easy and in the next two issues we'll give similar routines for conversions in other directions between these word processors.

The standard way to transfer documents out of View is to use the WRITE command to produce a file and then some sort of *load text to cursor* option to load it into the other format. With this process all the layout information – margins, centring, line spacing and so on – is lost and the resulting document is difficult to edit because it has a Return character at the end of each line, which stops it from being reformatted correctly.

This program is the answer: It takes a file in View format, saved with the SAVE command, and converts it to one which will load into InterWord, Wordwise, Wordwise Plus or Mini Office II. Obviously there are limitations, but you will find that the routine will transfer the majority of features, the major exceptions being headers, footers, macros and registers.

Because View does not distinguish between the end of a line within a paragraph and the end of a paragraph, a number of assumptions are made by the program when it translates a View file:

- Any left-justified line (indicated by the LJ edit command), right justified line (RJ) and centred line (CE) is intended to have a carriage return at the end of it.
- A blank line indicates the end of a paragraph.
- Any line which has more than 18 spaces after the text is a separate line and is intended to have a carriage return placed after it. This is done to ensure that items such as addresses are not reformatted. If this facility is not desired then line 380 should be removed.

If you transfer a file to Inter-Word a header is created: This is around about 3k of information to set things like screen colour, cursor position and page layout. The one created by this program is general purpose based on the information supplied in the View document. It sets:

- White text on a black background.
- Screen codes on – so that the position of tab characters and real Returns can be clearly seen.
- The cursor on the first letter of the text.
- The line spacing to correspond to the first definition contained in the View text – Inter-Word cannot change its line spacing within a document.
- Top and bottom margins and header and footer positions to match the first values defined in the View document. Note that these will not

Features of View text that are translated to Inter-Word

Rulers: The Inter-Word left margin is set to the position of the > character in the View ruler – if any – plus the value of any current left margin set by the LM edit command. Tabs will remain in the ruler.

Highlights 1 and 2: It is assumed that highlights are switched off at the end of each line by the View printer driver when these are translated as Inter-Word underlining and bold.

Centred text: Translated exactly

Right aligned text: Translated exactly

Left aligned text: Translated exactly

Justified text: Translated exactly

Page breaks: Both conditional and unconditional are covered.

Note that in View it is possible to have text to the right of a ruler, for example if words have been added without reformatting. Any such text will be reformatted within Inter-Word to match its current ruler.

Features of Wordwise, Wordwise Plus and Mini Office II text that are translated to InterWord

Rulers: These are translated into the appropriate LM, LL and DT commands.

Highlights 1 and 2: It is assumed that these are to be turned off at the end of each View line and they are translated into the printer codes used for underlining and bold on an Epson compatible printer. These are placed in the text using the OC command for Wordwise, CC for Mini Office II or US and UE for Wordwise Plus.

Page layout information: This is translated into TS and BS commands as it occurs. Note that as each of the top and bottom spaces is made up of two of View's margins, when any of the margins change a command will be placed in the new file. This sometimes leads to a duplication of information.

Centred text: Translated exactly

Justified text: In some cases the last line of text may not be justified.

- **Page breaks**:Both conditional and unconditional are covered.
- **Line spacing:** Translated exactly

always exactly correspond if the View text is not single spaced since Inter-Word multiplies its margins by the line spacing before printing.

- The printer information to correspond to an Epson-compatible printer although this can be changed – see the panel for details.

The header contains a great number of pointers to various parts of the text. In order to keep this program simple not all of these pointers are defined, so when the document is first examined in Inter-Word – by pressing Escape – it may not look exactly right. This is easily corrected by moving the cursor to the end of the document by pressing Shift+down arrow and back to the top by pressing Shift+up. All pointers will then be correct.

The two panels show the features that are transferred, so now you have an easy way to pass text from View to the other popular word processors. In the next two month's issues of *The Micro User* there will be companion programs. The first starts with an InterWord file and converts it into View, Wordwise, Wordwise Plus or Mini Office II format and the other produces View or InterWord files from Mini Office II, Wordwise or Wordwise Plus ones.

Creating an Inter-Word file for non-Epson printers

The following will help you convert the routine to suit your own needs:

The printer codes contained in lines 1700 to 1750 perform these functions:

1700: Italics on.
1710: Italics off.
1720: Underlining on.
1730: Underlining off.
1740: Bold on.
1750: Bold off.

The format of data to be placed in the file on each of these lines is (in turn):

- The length in bytes of the printer code which follows.
- The code, byte by byte.
- Enough zeros to fill up the field.

So if the code to turn italics on for a particular printer were – say – 1,2,3,4 then line 1700 would become:

```
1700BPUT#D%,4:BPUT#D%,1:BPUT#D%,2:BPUT#D%,3:BPUT#D%,
4:FOR G%=1 TO10:BPUT#D%,0:NEXT
```

Note that *G%* in the FOR statement now has a maximum value of 10 rather than the original 12, since there are now four bytes in the printer code rather than the two there were before.

```
   10 REM Inter-Word to VIEW, Wordwise a
nd Mini Office II converter
   20 REM by John Allen
   30 REM (c) The Micro User
   40 DIM trule%(50)
   50 title$=CHR$(132)+CHR$(157)+CHR$(13
1)+CHR$(141)+"     InterWord Conversions
"
   60 MODE7
   70 PRINT 'title$;'title$''
   80 pad$=CHR$(131)+"      "
   90 PRINT pad$;"1) to VIEW"
  100 PRINT pad$;"2) to Wordwise"
  110 PRINT pad$;"3) to Wordwise-Plus"
  120 PRINT pad$;"4) to Mini Office II"
  130 PRINT '" Enter choice";CHR$(134);
  140 REPEAT:option$=GET$:UNTIL INSTR("1
234",option$)
  150 PRINT option$
  160 IF option$="4" THEN term%=3:just$=
"FJ":nojust$="RR":tab%=9 ELSE term%=7:ju
st$="JO":nojust$="NJ":tab%=&DD
  170 PRINT ''CHR$(131);"  Inter-Word fi
le name:";CHR$(134);
  180 INPUT "" source$
  190 H%=OPENIN(source$)
  200 IF H%=0 THEN PRINT 'CHR$(136);CHR$
(129);"IW file does not exist, try again
":GOTO 170
  210 PRINT 'CHR$(131);"Name of file to
create:";CHR$(134);
  220 INPUT "" dest$
  230 D%=OPENOUT(dest$)
  240 cent%=0:right%=0:bold%=0:uline%=0:
start%=0
  250 PTR#H%=&49
  260 outstyle%=BGET#H% AND 16
  270 IF outstyle%=16 AND option$="1" TH
EN GOTO 330
  280 IF outstyle%<>16 AND option$<>"1"
THEN GOTO 330
  290 IF outstyle%=16 AND option$<>"1" T
HEN BPUT#D%,2:BPUT#D%,ASC"E":BPUT#D%,ASC
"P":BPUT#D%,2:BPUT#D%,ASC"D":BPUT#D%,ASC
"F":IF option$="4" BPUT#D%,3:BPUT#D%,13:
GOTO 330 ELSE BPUT#D%,13:GOTO 330
  300 BPUT#D%,128:BPUT#D%,ASC"P":BPUT#D%
,ASC"B"
  310 BPUT#D%,ASC"O":BPUT#D%,ASC"F":BPUT
#D%,ASC"F"
  320 BPUT#D%,13
  330 PTR#H%=&194
  340 hp%=BGET#H%
  350 ts%=BGET#H%
  360 bs%=BGET#H%
  370 fp%=BGET#H%
  380 pl%=BGET#H%
  390 A%=BGET#H%
  400 ls%=BGET#H%
  410 IF option$<>"1" THEN PROCwwmargins
:GOTO 560
  420 IF hp%>ts% THEN hp%=ts%
  430 IF fp%>pl% THEN fp%=pl%
  440 tm%=(hp%-1)*ls%
  450 IF tm%<0 THEN tm%=0
  460 hm%=(ts%-hp%)*ls%
  470 fm%=(fp%+bs%-pl%-1)*ls%
  480 IF fm%<0 THEN fm%=0
  490 bm%=(pl%-fp%)*ls%
  500 IF tm%<>4 THEN PROCmargins("TM",tm
%)
  510 IF hm%<>4 THEN PROCmargins("HM",hm
%)
  520 IF fm%<>4 THEN PROCmargins("FM",fm
%)
  530 IF bm%<>4 THEN PROCmargins("BM",bm
%)
  540 IF ls%<>1 THEN PROCmargins("LS",ls
%-1)
  550 IF pl%<>66 THEN PROCmargins("PL",p
l%)
  560 PTR#H%=&32
  570 ptr%=BGET#H%+256*BGET#H%
  580 PTR#H%=ptr%+2
  590 IF option$<>"1" THEN PROCwwtext:GO
TO 820
  600 B%=BGET#H%
  610 IF B%=255 THEN GOTO 820
  620 IF B%=&85 THEN PROCruler:GOTO 600
  630 start%=1
  640 IF B%>127 THEN PROCnewline
  650 IF B%>31 THEN BPUT#D%,B%:GOTO 600
  660 IF B%=30 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=31:GOTO 600
  670 IF B%=28 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=29:GOTO 600
  680 IF B%=26 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=27:GOTO 600
  690 IF B%=9 THEN BPUT#D%,9:GOTO 600
  700 IF B%=1 THEN BPUT#D%,128:BPUT#D%,A
SC"P":BPUT#D%,ASC"E":BPUT#D%,13:A%=BGET#
H%:A%=BGET#H%:GOTO 600
  710 IF B%=2 THEN BPUT#D%,128:BPUT#D%,A
SC"P":BPUT#D%,ASC"E":A%=BGET#H%:A%=BGET#
H%:no$=STR$(A%+1):FOR G%=1 TO LEN(no$):B
PUT#D%,ASC(MID$(no$,G%,1)):NEXT:BPUT#D%,
13:A%=BGET#H%:GOTO 600
  720 IF B%=3 THEN BPUT#D%,ASC"|":BPUT#D
%,ASC"P":GOTO 600
  730 IF B%=11 THEN BPUT#D%,&1D:bold%=1:
GOTO 600
  740 IF B%=12 THEN BPUT#D%,&1C:uline%=1
```

Turn to Page 122 ▶

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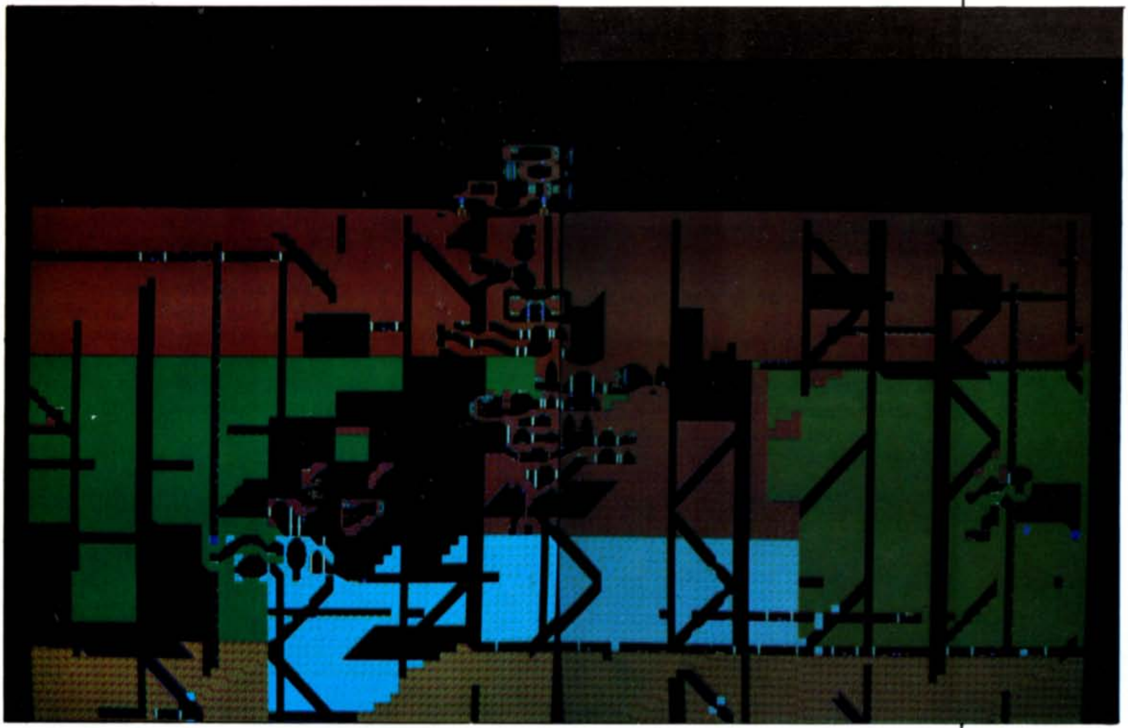

HERE'S help for anyone having problems with Superior Software's Exile, an arcade-adventure of stupendous proportions for the 8 bit BBC Micro. It works on an unexpanded machine but with sideways ram – or if you own a Master or Compact – you also get digitised sound and a bigger display. The map above represents just one tenth of the total world of Exile.

Out of Exile

Those who need help to tread the slippery slopes of the underworld can taste the delights of the Dark Chapters. They should, out of respect for the Innocent Ones, brand themselves with the words "I have read from the Dark Chapters".

The parts in bold give some indication of the content of the text so you can choose whether or not to read the whole clue.

To aid in deciphering the Dark Chapters a small program is included, type it in carefully. When run it will allow you to enter a passage and then provides an accurate translation.

The Dark Chapters

Chapter One

For mild sinners or those finding the going tough:

Pomz uif hsffo/zfmmpx nfubm **eppst** bsf fbtjmz **eftuspzfe** cz hsfobeft. (Qmbdf uif hsfobef ofbs uif epps).

Up hfu uif hsfobef jo uif mpxfs tqbdf-tijq tuboe po uif voefsdbssjbhf cfofbui uif uvcft boe ep b cpptu-kvnq boe uisvtu vq bu gvmm tqffe gmzjoh uispvhi uif uvcft up lopdl uif dboopo xjui zpvs ifbe.

Qvu pvu gjsft xjui uif gmbtl uibu ibt cffo gjmmfe xjui xbufs.

Hfu epxo uif xjoez tibgu cz qjdljoh vq b cpvmefs boe cpptu-uisvtujoh epxo.

Usbotqpsufs cfbnt dbo cf tipu uispvhi.

Uif ipsjapoubm dsbdlt cfofbui dfjmjoht dbo cf dsbxmfe uispvhi cz svoojoh boe kvnqjoh vq boe mzjoh epxo up hfu zpvs ifbe jo uif dsbdl. Uifo kvtu uisvtu tjefxbzt joup ju. Ipsjapoubm dsbdlt po gmppst dbo opu cf dsbxmfe uispvhi.

Qjol hsvct tipvme opu cf bmmpxfe up cf ljmmfe voofdfttbsjmz: zpv xjmm offe up nblf vtf pg tpnf pg uifjs qspqfsujft up tpmwf tpnf qspcmfnt effq up uif fbtu.

➤

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Chapter Two

For experienced sinners:
Hsvct boe xpsnt bqqfbs gspn spdlz hspvoe (opu gspn uif "ujmf csjdl" hspvoe). Uifz bsf buusbdufe cz opjtf boe bsf npsf bcvoebou effqfs epxo.
Uxp hsfobeft bsf cfuufs uibo pof. (Qsfuuz pcwjpvt fi?).
Gffe jnqt xjui uifjs obuvsbm gppe. (Xibu?)
Gmvggz dbo cf qvtife uispvhi uif ipsjapoubm dsbdlt (tp...?).
Dibuufs dbo cf gfe xjui dpspojvn dsztubmt (xifsf gspn?).
Uif qjol gsphnbo dbo cf mfe xjui qjol hsvct.
Uif hsffo gsphnfo dbo cf qvtife cbdl vtjoh uif cmpdl boe qjol gsphnbo. Zpv xjmm offe up ifmq uif qjol gsph up qvti cz ...?

Chapter Three

For those past hope:

Uif hsffo tmjnft dbo cf gfe xibu?
Dpspojvn spdlt dbo cf gmpbufe po uif mbshf cmpdl.
Vtf uif qjol gsphnbo up qvti zpv uispvhi nvtisppnt.
Hfu uif sbejbujpo qspufdujpo qjmm pvu pg uif tnbmm dbwfso cz vtjoh b qjsboib gjti.
Fbtz xbz up qvti bo pckfdu uispvhi b ipsjapoubm dsbdl (jg ju jt tmjhiumz ubmmfs uibo uibu dsbdl): xijmf ipwfsjoh wfsujdbmmz, ipme uif pckfdu ofyu up uif dsbdl, uifo qsftt uif mjf-epxo lfz boe uisvtu tjefxbzt joup uif dsbdl uispxjoh uif pckfdu tjefxbzt, uifo tippu ju uispvhi uif sftu pg uif xbz.
Zpv'sf po zpvs pxo opx.

```
10 name$="Dark Chapters Translator"
20 MODE 3
30 DIM text 256
40 REPEAT
50 CLS
60 PRINT name$'STRING$(LENname$,"=")
70 INPUTLINE'"Enter text:"$text
80 FOR A%=0 TO LEN($text)-1
90 text?A%=text?A%+(C%>65)
100 NEXT
110 PRINT'"Translated."
120 PRINT'"Send to printer? (y/n)";
130 yes=FNyesno
140 IF yes VDU2
150 PRINT'$text'
160 VDU3
170 PRINT'"Another one? (y/n)";
180 yes=FNyesno
190 UNTIL NOT yes
200 MODE7:END
210 DEF FNyesno
220 REPEAT
230 A%=INSTR("YyNn",GET$)
240 UNTIL A%>0
250 PRINT MID$("YyNn",A%,1)
260 =(A%<3)
```

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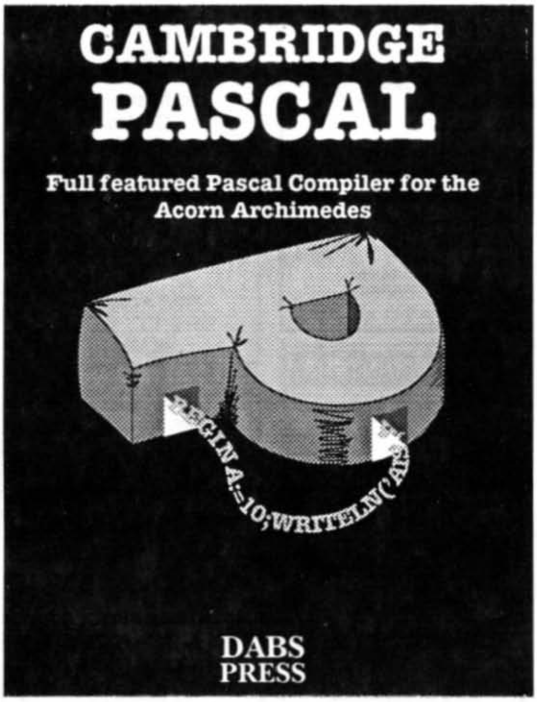

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Cambridge Pascal was written by Paul Fellows, former Head of Language software at Acornsoft, and author of the Acornsoft S-Pascal compiler, and our own ABC Compiler.

The price of the package is £79.95 (£69.52+VAT). A free demonstration disc and full specification sheet is available on request.

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Cambridge Pascal is available from all Acorn dealers or in case of difficulty post free from Dabs Press (MU), 5 Victoria Lane, Whitefield, Manchester M25 6AL. Tel. 061-766 8423. Fax. 061-766 8425. Access/Visa accepted. Foreign price £69.52 plus postage £2.50 (surface) or £12 (air) Full Archimedes or BBC catalogue available on request.

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Hewlett Pack Laser II	1248.00
Hewlett Pack laser IID	1939.75
Panasonic KXP 4450	1319.40
Qume Crystal Print WP	995.00
Qume Script Ten Postscript	2969.00
Star LP8	1249.00

All laser printers include 1 year on site maintenance

FAX

Amstrad FX9600T	535.00
Canonfax	
Fax80	623.00
Fax230	915.00
Fax410	1415.00
Nefax N2 (Special Price)	849.00
Nefax N3	1006.00
Panfax UF150	915.00
Panfax UF250	1265.00
Sanyofax 100	989.00
Sharp FO-80	849.00
Sharp FO-150	959.00
Sharp FO-210	1269.00

REPAIRS – Most Repair work undertaken. Please telephone us for competitive quotes.

ANOTHER BRANCH OPENING SHORTLY – Education, Government & PLC orders welcome

Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England
Tel: Watford (0923) 37774 Tlx: 8956095 Fax: 01 950 8989
Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.
All prices exclusive of VAT; subject to change without notice & available on request.
Credit Card Orders (ACCESS & VISA) Tel (0923) 33383 or 50234 (24 Hours)

Acorn
The choice of Experience

The choice before and after the experience

Archimedes micro

Now supplied with the New RISC OS

System	Basic	Mono	Colour	Multiscan
305	£725	£785	£914	£1144
310	£899	£959	£1088	£1318
310M	£959	£1019	£1148	£1378
410/1	£1199	£1259	£1399	£1618
420/1	£1699	£1759	£1888	£2118
440/1	£2499	£2559	£2688	£2918

(Securicor carr. £10 on Archimedes)

A3000 – A RISC worth taking

● A3000 Archimedes Microcomputer	£649
● 3.5" External Drive	£89
● Monitor Stand	£24
● Twin Monitor Stand	£–
● External Podule Case	£14
● Serial Upgrade	£19
● Dust Cover Micro only	£4
● Micro + Monitor	£7
● User port/MIDI upgrade	£49

SPECIAL OFFFER

This month we have a very special offer open to absolutely anyone who wishes to purchase an Archimedes micro from us. Note that no special membership is required to take advantage of this offer.

We will donate 10% of micro's value towards any goods you wish to purchase, like disc drive, software, printer etc.

PLUS . . . PLUS . . . PLUS . . .
In addition to the above offer, we are giving away completely FREE OF CHARGE, 12 months subscription to the most informative Archimedes specialist magazine, ARCHIVE.

Desk Top Publisher

Acorn's Archi DTP Package	**£125**
Impression DTP Package	**£135**

ACCESSORIES

● NEW Multitasking RISC OS	£29
● MEMCI Upgrade	£68
● ARM 3 Upgrade	£575
● ROM Podule Acorn	£45
● ROM Podule (Computer Concepts)	£45
● ROM Podule (C C) with Battery Backup	£59
● 2 Podule Backplane (Watford)	£25
● 4 Podule Backplane (Watford)	£38
● Backplane FAN only (for Hard Disc)	£9
● 3.5" 800K 2nd Floppy Drive (305/310)	£118
● 5.25" 800K external Floppy Drive	£105
● I/O Podule (with Analogue port, User port, & 1MHz bus)	£80
● MIDI add-on to I/O Podule	£29
● MIDI Expansion Card	£65
● Sound Sampler Mono (Armadillo)	£129
● Sound Sampler Stereo (Armadillo)	£166
● Sound Sampler Stereo /Midi (Armadillo)	£186
● Chromalock Podule	£280
● Econet Network Board	£49
● Archimedes IEEE Interface Adaptor	£269
● Dual RS232 Podule	£195
● 16 bit parallel I/O Card	£195
● NEW – Archi MK II Replacement Mouse	£39
● RB2 – A Archimedes Marconi Tracker Ball	£52
● PC Emulation Pack incl. MSDOS 3.21	£69
● Software Developers Toolbox	£175
● Floating Point Unit	£549
● SCSI Adaptor Expansion Card	£275
● Archimedes RISC-OS Reference Manual	£79
● Arm Assembly Lang. Prog. Manual	£15
● Archimedes BBC Basic Guide	£20

0% FINANCE

We are once again able to offer 0% finance for the purchase of an Archimedes or BBC Master micros and some peripherals. For further details please write in or telephone:
0923 37774 ext. 203, 202 or 201

Archimedes Special Upgrades

The impossible is now possible. Watford's Ram booster system adds more Ram to your Archimedes. Upto 2 and 4 Megabytes for A3000 and 2 & 4 Megabyte kits for the A300 & 400* series.
(* For A400 series we also supply low cost Hard Disc upgrades too.)

FREE RISC-OS
RISC-OS is certainly the most flexible and powerful operating system available on any personal computer. The new interface allows full and easy access to the power of the Archimedes. More importantly, RiscOs allows a number of programs to be executed simultaneously, so that you can transfer information between windows. But the lack of memory prevents you getting the most from Risc-Os, since the number of programs you can load is limited by the memory your computer has – even 1Meg is barely enough to fully utilise Risc-Os. Watford's RAM upgrades frees Risc-Os by giving it extra Ram it needs.

Runs the Most Powerful Software
New sophisticated Archi software is designed with 1 megabyte of Ram in mind. The innovative features of modern applications will mean that they are less likely to run on small memory computers. Even Acorn's own DTP software is severely compromised by memory shortage on such micros. Adding more Ram means that your Archimedes will be ready to run the most sophisticated and demanding of software.

Easy to Fit
Watford Electronics have pioneered Memory Expansion Technology so that you can install 1,2 or 4 megabytes of RAM upgrades without having to use anything more dangerous than a screwdriver. The RAM Expansion System for the A300 series is supplied on 2 cards which fit neatly inside and will not interfere with any other part of the computer. Using the special tool supplied, the cards simply drop into sockets on the mother-board, and connect with the ribbon cable supplied. That is all there is to it.

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

UP10 – 1MB RAM + 20MB Hard Disc	£299
UP20 – 2MB RAM + 20MB Hard Disc	£499
UP30 – 3MB RAM + 40MB Hard Disc	£679
UP40 – 3MB RAM + 53MB Hard Disc	£795

(P.S. When purchased with an A410/1, the upgrades will be fitted at no extra cost)

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required.

● A3000 Watford 1MB RAM Upgrade	£149
● A3000 Watford 4MB RAM Upgrade	£399
● A305 0.5 Meg RAM Upgrade	£110
● A305/310 2Meg RAM Upgrade	£325
● A305/310 4Meg RAM Upgrade	£549
● A410/1 RAM Upgrade to 2 MB	£129
● A410/1 RAM Upgrade to 4 MB	£379

(Carriage on Add-ons £3)

Watford's 20Meg & 40Meg Archimedes Hard Disc

Watford Electronics' 20Meg & 40Meg hard disc fits internally into the Winchester slot provided.
It is fully compatible with Acorn's hard disc upgrade, (the only difference is our low price). Price includes the Hard Disc Drive, Controller Podule & fitting instructions.
P.S. The 310 upgrade requires a backplane and a fan.

● 3HDP – Hard Disc Podule only	£215
● 3HD20 – 20Meg H' Disc + Podule for 310	£329
● 3HD40 – 40Meg H' Disc + Podule for 310	£439
● 2 Podule backplane (Watford)	£25
● 4 Podule backplane (Watford)	£38
● Fan for the backplane	£9
● 4HD20 – 20 Meg Hard Disc for 410	£179
● 4HD40 – 40 Meg Hard Disc for 410	£299
● A3000 Hard Disc Podule only	£279
● A3000 20 Meg Hard Disc	£369
● A3000 40 Meg Hard Disc	£489

(Carriage £7)

By popular demand, we are now supplying refurbished and fully guaranteed BBC Micros with Disc Filing System
(Please telephone for price & availability)

WORDPROCESSORS

Wordwise +	£18	Pipedream	£89
Image Writer	£25	P.Spellchecker	£40
Interword ROM	£35	View	£49
1st Word Plus	£75	Viewspell	£32
Archie Spell Master	£39	Viewindex	£12
Pipedream 3	£135	Graphic Writer	£25

DATABASES

AlphaBase	£39	Flying Start II	£80
Viewstore	£49	System's Delta +	£60

SPREADSHEETS

Intersheet ROM	£35	Viewsheet	£49
Sigmasheet	£59		

BUSINESS GRAPHICS

GammaPlot	£59	Interchart ROM	£25

INTEGRATED PACKAGES

Logistix – Database, Spreadsheet, Time Management & Business Graphics	£94
Pipedream 3 – Wordprocessor, Database & Spreadsheet	£135

(P&P on above £2)

GRAPHICS, ART, DESIGN & GAMES

GRAPHICS			
		Hyperpack (12)	£79
Atelier	£84	Hoverbod	£12
Artisan II + Disc	£59	Ibix the Viking	£16
Pro Artisan	£140	Inter Dictor	£29
Archeffect	£20	Jet Fighter	£12
Autosketch	£69	Minotaur	£11
Gamma Plot	£60	Missile Control	£13
Graph Box	£64	Orion	£12
Kermit	£46	Pacmania	£16
Lingenuity Presenter	£24	Repton 3	£17
		Thundermonk	£12
Render Bender	£59	Zarch	£15
GAMES		Miscellaneous	
Alerian	£12	Arc TFS	£25
Clares 3 Pack	£12	Toolkit (Beebug)	£32
Conqueror	£19	Toolkit (Clares)	£42
Enthar Seven	£29		
Freddies Folly	£12	Hearsay Comms Pack	£55

COMING SOON

A3000 Podule expansion racking system to accept all existing Archi 310 & 410 podules

FINANCE AVAILABLE

In these days of expensive borrowing, we are pleased to have negotiated a special low rate finance deal for our customers, with flat interest rate of 12.25% per annum, typical APR 25.5%.

In addition to the above, we are able to offer all Archimedes and BBC Master computers as well as selected hardware on a 0% interest free finance deal.

For further details please telephone:
0923 37774 ext 223/203/201.

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77	£94 each
ANSI C Release 3	£149
Assembler; LISP or Prolog X	£180 each
LOGOTRON LOGO	£55
BASIC Compiler	£89
TWIN EDITOR	£27

(P&P £2 on above packages)

MINERVA's Archimedes Software

Sigmasheet	£57	System Delta+	£69
Deltabase	£24	Sales Ledger*	£53
Home Accounts*	£42	Purchase Ledger*	£53
Stock Manager*	£53	Reporter	£20
Nominal Ledger*	£53	Mailshot	£33
Ancestry	£59		
Gammaplot	£57		

System Delta + Reference Manual	£25
Order Processing/Invoicing*	£53
School Administrator	£66

** Requires System Delta*
(P&P on above items £2)

Archimedes to BBC SERIAL LINK

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

Only £15

Archimedes 5.25"/3.5 Disc drive Interface

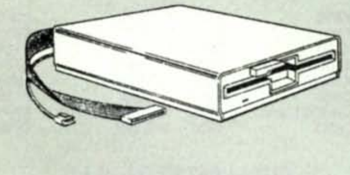
With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. NO SOLDERING is involved. Supplied complete with necessary lead.

Only £21

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£439** ***(carr £7)***

XMAS FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.
FREE with every BBC Master purchased from us during December

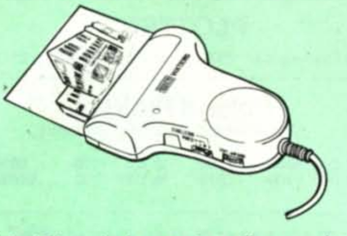
ADD-ONs & ACCESSORIES

Turbo 65C102 Add-on Module	£118
Econet Module for the Master	£49
Twin ROM Cartridge for Master	£8
Quad ROM Cartridge for Master	£12
Universal Processor Adaptor	£75
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99

Filestore E01S	£899	Filestore E40s	£799
Filestore E60S	£1080	Ecolink	£270

(Carr. £2 to £7 depending on the weight)

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system. The package includes the most comprehensive utility software available for the Archimedes, a high quality, ergonomically designed to fit the shape of your hand, (see drawing above) scanner, which is fitted with a warning LED that will indicate if the scanner is being moved too quickly for accurate results. Additional twin guide rollers ensure precise tracking over the image, to make the best use of the high resolution available with this sytem. The yellow/amber illumination of our Mk II scanner, enables you to achieve optimum accuracy. It is capable of scanning upto an amazing 400 DPI. The scanning area is 4" wide and the height is only limited by the maximu amount of memory available.

Launch offer £149
(P&P £4)
(Please write in for technical details)

Z88 Portable Micro

Watford Electronics are the largest Z88 Dealer in the UK

Only: **£195** (Carr £4)

FREE

With every Z88 purchased from us this month, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

32K RAM Pack or 32K EPROM Pack	£18.00
128K RAM Pack or 128K ROM Pack	£45
512K RAM Pack	£175
Z88 Eprom Eraser Unit	£35
Z88 Pipedream Spellcheck (Colton)	£52
Z88 Spellmaster for Pipedream	£51
Z88 Carrying Case	£9
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	£6
Z88 Serial Printer Cable	£9
Z88 Parallel Printer Cable	£25

● Z88 to BBC Link	£20	● Z BASE	£56
● Z88 to PC Link II	£30	● Z TAPE	£42
● Z88 to Macintosh	£52	● Z TERM	£42
● Z88 Mains Adaptor	£9	● Z88 Modem	£149

NEW

Archi Graphic Tablet

This package allows Archimedes users to take advantage of the low cost graphpad (sometimes called a digitiser tablet, but not to be confused with a video digitiser!)

The Archi Graphpad offers performance and accuracy comparable to other graphics tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely.

The software, which is in the form of a relocatable module (RM), intercepts the system calls which control the mouse, and so allows virtually all mouse based Archimedes software to be controlled using the tablet without any modification. The only exceptions are programs which use the serial port, as the tablet is physically connected to this port itself.

Graphics programs such as Artisan, Pro Artisan, AutoSketch, Oak DTP, and the RiscOS Draw, Paint and DTP packages are considerably enhanced by the use of the graphics table as opposed to the mouse, although it can, of course, be used with any other mouse driven application.

The software allows the user to define how much of the tabler's 12" x 12" working area to use, allowing very fine control when drawing freehand or tracing from a variety of differently sized drawings, diagrams, photographs, etc.

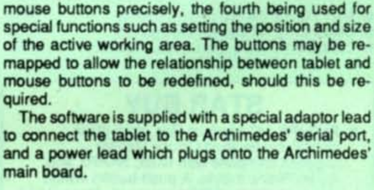
The tablet driver is compatible with all Archimedes machines, and with both Arthur and RiscOS operating systems.

The pointer is moved via a four button puck complete with transparent lens and crosshairs for optimum accuracy. Three of the buttons emulate the Archimedes mouse buttons precisely, the fourth being used for special functions such as setting the position and size of the active working area. The buttons may be remapped to allow the relationship between tablet and mouse buttons to be redefined, should this be required.

The software is supplied with a special adaptor lead to connect the tablet to the Archimedes' serial port, and a power lead which plugs onto the Archimedes' main board.

Launch Price £259
(Price includes Tablet, leads and software)
(P&P £4)

Archimedes Real-Time Digitiser



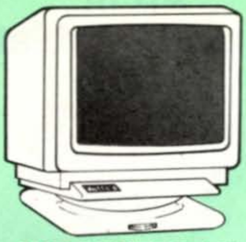
Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £249

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Continued→ → → → → → → → →

MONITORS



MICROVITEC 14"

● **1431** – Standard resolution as used on the BBC television computer programme	**£175**
● **1451** – Medium resolution, suitable for word processing in mode 0	**£219**
● **1455** – MS Medium resolution, ideal for Archimedes	**£220**
● **1441** – High res, exceeds the capabilities of the BBC Micro	**£359**
● **1431AP** RGB + PAL and AUDIO	**£199**
● **1451AP** RGB + PAL and AUDIO	**£255**
● **2030 CS** 20" Med Res	**£399**
● **2040 CS** 20" Hi Res	**£675**
● Dust Cover for Microvitecs	**£5.50**
● **Touchtec 501 Touch Screen**	**£239**

14" MULTISCAN COLOUR

● **TAXAN** Multisync 770 Plus	**£415**
● **TAXAN** Multiscan 870 16" Monitor	**£575**
● **TAXAN** Viking 19" Paper White, High Resolution (1152 x 896 with Archi 400 series)	**£799**
● **EIZO** 8060H – For technical info. read the review in Micro User, Jan. '89	**£429**
● **EIZO** 9060S Super High resolution multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA. 0.28 Dot pitch	**£469**

TAXAN 12"

● Super Vision 3 – **Type 625** Super Hi-res RGB Colour, Green/Colour Switch	**£269**

PHILIPS

● **BM7502** 12" Hi-res Green Monitor	**£64**
● **BM7522** 12" Hi-res Amber Monitor	**£68**
● **CM8833** 14" Med. Res Colour Monitor	**£195**

STAR BUY

● **PHILIPS** 14" Medium Res, dark glass, attractively finished Colour Monitor – supplied complete with RGB, SKART and Audio/Phono Inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £189

Dust Cover for Philips Monitors **£6**

(Securicor carriage on Monitors £7)

SPARE LEADS

BNC Lead for Zenith or Philips	**£3**
Skart Monitor Lead	**£5**
RGB lead for TAXAN Monitors	**£3**
Archimedes Colour Monitor Lead	**£7.50**

SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors **£8** (carr. £2.50)

for 14" Monitors **£12** (carr. £2.50)

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

Price £12

CONCEPT KEYBOARDS

Standard A3 Keyboard with BBC Software	**£143**
Standard A4 Keyboard with BBC Software	**£117**

PLOTTERS

● Plotmate A4S **£379** ● Plotmate A3M **£549**

Roland Plotters

(Official Roland Appointed Distributor)

● **DXY 880A**	**£560**	● **DXY 1100**	**£630**
● **DXY 1200**	**£879**	● **DXY 1300**	**£1035**

TAXAN KP-815 PRINTER

Offer Price £149

RS232 Interface	**£49**
RS232 Interface with 2K Buffer	**£69**
RS232 Interface with 16K Buffer	**£89**

Panasonic KX-P1081

SALE OFFER only: **£135**

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us)

KX-P1180 Printer Offer

Panasonic KX-P1180 printer, Dump Out 3, Screen Dump ROM & a BBC printer lead.

Offer Price £146

Panasonic Printers

● **KX-P1124** 24pin 80col. 192/63 CPS	**£245**
● **KX-P1180** 9pin 80col. 144/38 CPS	**£146**
● **KX-P1540** 24pin 136col. 240/80 CPS	**£435**
● **KX-P1592** 9pin 136col. 216/45 CPS	**£275**
● **KX-P1595** 9pin 136col. 288/61 CPS	**£355**

● **Panasonic KX-P4450** LASER PRINTER Latest technology at Watford's special offer price **£1,349**

● Spare Toner	**£29**	● A4 Feeder	**£55**
● Drum Unit	**£149**	● Developer	**£115**
● 1MB RAM Board			**£299**

Panasonic Accessories

Cut Sheet Feeders

KX-P1592/1595 (P32)	**£175**	KX-P1540 (P35)	**£185**
KX-P1124 (P36)	**£88**	KX-P1180 (P37)	**£79**

BUFFERS

P12 4K buffer Board for 1081	**£55**
P42 32K buffer Chip for 1592/1595	**£25**
P43 32K Buffer Chip for 1540/1124	**£25**

Serial Interfaces

P17 P1081/1592	**£32**	P19 P1124/1180	**£55**

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595	**£8**
P115 for KX-P1180	**£8**
P145 for KX-P1124	**£8**
P140 for KX-P1540	**£10**
Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red	**£9.95 each**

INTEGREX COLOUR JET

● Colour Jet 132 Printer	**£515**
● Paper Roll	**£6.50**
● Screen Dump Software	**£10**
● Colour Cartridge	**£16.50**
● Black Cartridge	**£10.35**
● 100 A4 OHP transparencies	**£55**
● 8K Serial Interface Optional	**£123**

NEW – Intergrex COLOURCEL NPQ Ink Jet Colour Printer **£2,695**

NEC P2200 PINWRITER

24 pin; 80 column; 168CPS – 56CPS LQ; Epson LQ compatible, 7K Buffer; 7 resident FONTS, Friction & Tractor feed, front load single sheet feed, etc.

£245

XMAS OFFER:

We are giving away a Cut Sheet Feeder Unit FREE with every P2200 purchased during December.

Pinwriter Serial Interface (optional)	**£55**
P2200 Cut Sheet Feeder	**£59**
Additional Font Cartridge	**£25**

NEC PINWRITER P6/P7 Plus

NEC P6+ 80 columns	**£439**	**NEC P7+** 136 columns	**£575**
Colour Option	**£74**	Serial Interface	**£73**
Cut Sheet Feeder	**£125**		
NEC Ribbons for		P6 **£8;**	P7 **£9.50**

Hewlett-Packard Lasejet 2

A low cost, high performance laser printer – 4 ppm, 512K RAM 4 fonts, 300 x 300 DPI, Serial & Parallel interfaces, 250 Sheets tray, etc. Ideal for DTP applications

Launch offer **£949**

Star Printers

Star LC10	**£139**	LC10 Colour	**£195**
Star LC24-10	**£215**	XB24-10 Colour	**£425**
NB24-10	**£425**	XB-10 Colour Kit	**£24**
LC10 Colour Ribbon	**£5**	Cut Sheet Feeder	**£65**

EPSON PRINTERS

EX800	**£410**	LQ550	**£259**
EX1000	**£564**	LQ860 Colour	**£539**
FX850	**£310**	LQ1050	**£549**
FX1050	**£395**	LQ1060	**£679**
FX1060	**£679**	LQ2550+	**£895**
LQ550	**£259**	LX400	**£139**
GQ3500 Laser	**£999**	LX850	**£185**
LQ850	**£405**	SQ2500	**£899**

CUT SHEET FEEDERS for

EX800 **£149;** FX800/LQ800 **£149;** FX850/LQ850 **£149;** FX1000/LQ1000 **£179;** LQ500/LX800 **£79;** LQ1050 **£175;** LQ2550 **£390.**

TRACTOR FEED for

LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

ACCESSORIES

● EX800/1000 Colour Option	**£55**
● EX800/1000 Colour Ribbon	**£18**
● LQ2500 Colour Option	**£65**

(Securicor Carriage on Printers £7)

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer

RS232	**£32**	RS232 + 2K Buffer	**£52**
IEEE 488	**£40**	RS232 + 8K Buffer	**£79**

PRINTER LEADS

BBC Centronics 4' long	**£5**
BBC Centronics 6' extra long	**£7**
Compact's Special Centronics Lead	**£7**
Archimedes Printer Lead 1 metre	**£6**
Nimbus Centronics Lead	**£12**
IBM Parallel Lead 1 metre	**£6**
Double Ended 36 way Centronics Lead 4'	**£7**
Double Ended 36 way Centronics Lead 6'	**£9**
MSX Centronics Parallel Lead 4'	**£12**
RS232 Leads (Various)	**P.O.A.**

Listing Paper (Perforated)

● 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
● 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
● 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£19
● 1,000 Sheets 15" x 11" Fanfold Paper	£9
● 1,000 Sheets true A4 Fanfold Paper 70gms	£11
● 2,000 Sheets true A4 Fanfold Paper 70gms	£19
● Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

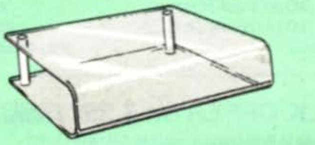
PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£5.00
1,000 90 x 36mm (Twin Row)	£4.90
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.25

Carriage on 1,000 Labels £1.00

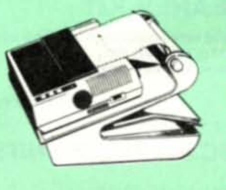
Perspex Printer Stand



Give you Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and refold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

80 Column version £23 (carr. £3)

132 Column version £26 (carr. £4)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	**£3.00**	**–**
BBC Micro	**–**	**£3.50**
BBC Master	**–**	**£4.00**
Archimedes Micro pair	**–**	**£9.00**
Citizen 120D	**£3.95**	**£4.50**
RX/FX80/MX80	**£3.00**	**–**
DMP2000	**£3.75**	**£4.75**
EX/LQ800	**£4.50**	**£4.50**
EX/LQ1000	**£7.50**	**£5.00**
RX/FX80/85/800/MX80	**£3.90**	**–**
RX/FX100/1000	**£5.75**	**–**
Kaga/Taxan KP810/815	**£4.90**	**£5.00**
LC10 (Black)	**£4.25**	**£5.00**
LQ500/800	**£3.75**	**£5.00**
LQ1050/LQ2500	**£8.50**	**£5.50**
LX80/86/800	**£3.80**	**£4.50**
M1009/GLP	**£3.80**	**£3.75**
NEC P2200	**£6.00**	**£5.00**
Panasonic KX1080/81	**£4.00**	**£4.75**
SQ2500	**£23.00**	**£5.50**
Star NL10	**£3.75**	**£4.50**
Olivetti Ink Jet Cartridges (set of 4)	**£9**	

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changer

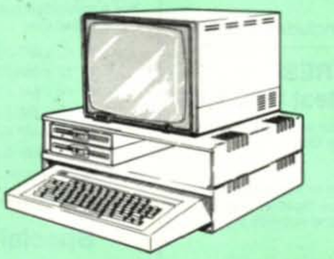
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£20	£22	£3
3 to 1	£27	£30	£3
5 to 1	£36	£39	£4

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



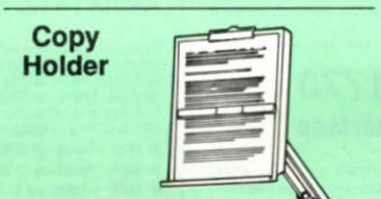
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£13**
Double BBC Plinth	420 x 310 x 210mm	**£24**
Printer Plinth	420 x 310 x 105mm	**£12**
Single Master Plinth	490 x 310 x 105mm	**£14**
Double Master Plinth	490 x 310 x 210mm	**£26**

(Carr. Single plinth £2; double plinth £3)

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding you paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top **£7** (carr. £3)

Angle poise **£12** (carr. £3)

Handy Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics	**£20**
Compact AB Switch RS232	**£19**

(Cables extra at £6 each)

MEGABUFFER 256

The Smallest 256K Printer Buffer Unit in the world **38mm x 130mm x 134mm.**

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatiblity with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £149 (carr £5)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms, see the feature in our advert.

THE EPSON RX-FX-KAGA

Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you are with all sorts of printouts to show its capabilites – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

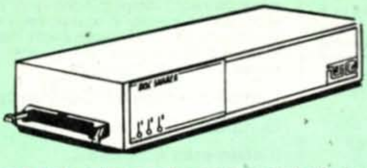
It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Continued→ → → → → → → → →

DISC DRIVE SHARER



(Ideal for educational establishments)

At last, a low cost alternative to the Econet system.Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price : **£65** Price includes 3 Cables

NOW WITH EXTRA FEATURES AT NO EXTRA COST – Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

If you already have the Watford Electronics DFS and wish to incorporate these new facilities then simply return your existing DFS ROM to us together with £5 remittance for an upgrade. Please pack the ROM securely and address the package to our Upgrades Dept.

WATFORD's & ACORN's DFSs

Watford's popular and widely acclaimed DFS has now been available for six years and has gained a large following amongst serious and educational users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. ***(P.S. Watford's highly sophisticated DFS is fully compatible with Acorn standard DFS), (while Acorn's 1770 DFS is fully compatible with Watford's Mk II DDFS)***

● *Watford's sophisticated DFS ROM only*	**£16**
● *We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only*	**£12**
● *DFS Manual (Comprehensive)*	*(no VAT)* **£6.95**

(P.S. Our DFS manual is the only comprehensive Manual available for the BBC micro and covers both Acorn & Watford DFSs)

- *DNFS ROM only* **£17**
- *ADFS ROM only* **£25**

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

NEW

Watford's MkII 1770

Double Density DFS Interface

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£30.00**.

● SPECIAL PRICE	**£44.00**
● DDFS Manual	(No VAT) **£6.95**
● We will exchange your existing DFS Kit for our sophisticated DDFS for only	**£25.00**

Please note, as the MkII DDFS is a hardware and sofware upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

DUST COVERS (For our Disc Drives)

Single CLS (without PSU) **£3.20**	Twin CLD (without PSU) **£3.85**
Single CS (with PSU) **£3.25**	Twin CD (with PSU) **£3.90**

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

● *10 x 5.25" S/S D/D 40 Track Diskettes (744)*	***£5***
● *10 x 5.25" D/S D/D 40 Track Diskettes (745)*	***£6.50***
● *10 x 5.25" S/S D/D 80 Track Diskettes (746)*	***£8***
● *10 x 5.25" D/S D/D 80 Track Diskettes (747)*	***£9***
● *10 x 5.25" 1.6M D/S D/D High Density Discs for IBM XT and AT*	***£14***
● *10 x 3.25" S/S D/D 40/80 Track Discs*	***£10***
● *10 x 3.25" D/S D/D 40/80 Track Discs*	***£10***
● *10 x 3.5" High Density Diskettes*	***£25***

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

● *10 x* ***M3*** *3.5" D/S D/D 80 Track Discs*	***£9***
● *10 x* ***M9*** *3.5" Double Side High Density*	***£22***
● *10 x* ***M4*** *5.25" S/S D/D 40 Track Discs*	***£5***
● *10 x* ***M5*** *5.25" D/S D/D 40 Track Discs*	***£7***
● *10 x* ***M7*** *5.25" D/S D/D 80 Track Discs*	***£9***
● *10 x* ***M8*** *5.25" D/S H/D Hi-Density Discs*	***£14***
● *3" Double Sided Discs*	***£2.50*** *each*

Special BULK OFFER on 5.25" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

PRICES SLASHED

BULK PACK DISCS in lots of 100

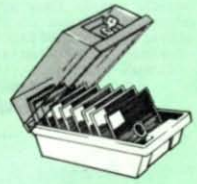
Type	**S-S 40T**	**D-S 40T**	**D-S 80T**
● Without Sleeves	**£30**	**£35**	**£40**
● With Sleeves	**£33**	**£38**	**£43**

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

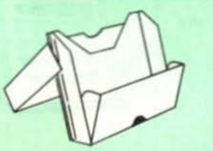
ANTISTATIC LOCKABLE DISC STORAGE UNITS



Gives double protection – Strong plastic case that affords real protection to your discs.
Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.
Dividers and adhesive title strips are supplied for efficient filing of discs.

● **M35** – holds up to 50 5.25" discs	**£4.95**
● **M85** – holds up to 95 5.25" discs	**£6.95**
● **M25*** – holds up to 25 3.5" discs	**£4.95**
● **M50** – holds 50 3.5" discs	**£6.50**
● **M10** – holds 8 of No. 10 Data Cartridges	**£15**

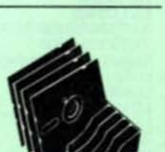
* Not lockable



PLASTIC LIBRARY CASES

Holds up to 10 5.25" Discs. **Only £2.00**

DISC PLONKER RACK



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the harzards of fingerprints, scratches, dust, coffee and an untidy desk.
Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

DISC ALBUMS

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket. **£4**

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with an Utilities Disc.

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

***All our Disc Drives are Double Sided and will operate in both Single and Double Density modes.** Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*

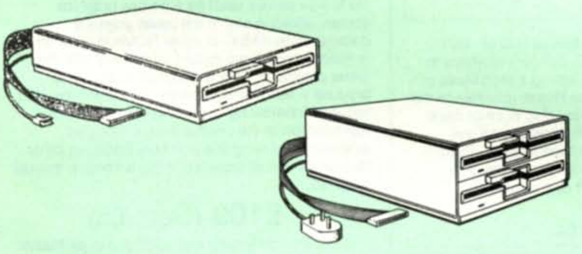
Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high qulity NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public. If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

*Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.** We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £18. (At Watford we anticipate your needs of tomorrow, not just today!)*

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £75	CLD400 £168	CS 400S £85	CD400 £188
800K (1,44M		CLD 800S £153		CD 800S £163

● TWIN Disc Drive Case, complete with Power Supply & Cables **£43**
Securicor carriage on Disc Drives £6 to £7

Prefix ***C** = Cased Drive*
***L** = Less PSU*
***S** = Single*
***D** = Double*

Suffix ***S** = 40-80 Switchable*

e.g. *CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.*

Cable to connect 5.25" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer

- The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.
- A comprehensive User Friendly Manual.

A Bargain at Only **£119** (£7 carr) (Offer valid while stocks last)

3.5" DISC DRIVE OFFER

These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Drives to connect to BBC Micros own PSU

● CLS35 400K Unit £69 ● CLD35 Twin 800K £125

Drives with built-in Power Supply Unit

● CS35 Single 400K £85 ● CD35 Twin 800K £135

(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).

WATFORD's WINCHESTER DRIVES

Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.

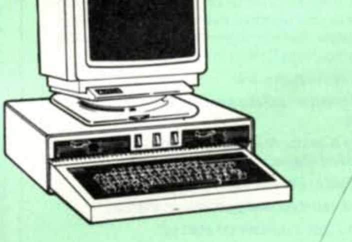
Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!

Compatible with the Master, and the BBC B (with 17 X disc interface).

● 30 Megabyte BBC Hard Disc **£369** (carr £9)

CDPM 800S

DP35-800S



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC B & Master £179

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.

To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.

The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £165

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued→ → → → → → → → →

QUEST
MOUSE Mk II

● Quest Mouse II & Quest Paint	£58
● Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont	£89
● Quest Mouse II only	£29
● Quest Paint Software only	£34
● Quest Font Disc	£15
● Quest Mouse Mat (Red or Blue or Green please specify)	£3
● Part Exchange your unreliable AMX Mouse for a Quest Mouse for only	£22
● GXR ROM for the BBC Micro	£22

(P.S. Quest Paint is not compatible with BBC Compact)

N.B.
1. Quest Paint supplied complete with Software in a 32K ROM, Comprehensive User Guide and a Utility Disc.
2. Quest Font Disc has 22 text FONTS for use within Quest Mouse.

ConQuest

Watford's Quest package is an extremely powerful and flexible drawing package, with very wide and unusual features. However, since its launch various suggestions for even more advanced and powerful facilities were received from the Quest users. ConQuest allows you these more advanced facilities, like, distortion of a cutout to any shape and a full font designer. If you also have a GXR ROM in your machine or you are using a BBC Master then ConQuest will take advantage of this to give ellipses at any angle, sectors and arcs, etc. Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

Some of the features are:

- *Pick filenames off the screen for loading and saving.*
- *Rotate a cutout to any angle and Distort it to any four sided shape.*
- *Has Built in Font editor.*
- *Default brushes and patterns on startup.*
- *16 x 16 font available on start up.*
- *Ability to reset patterns, fonts and brushes to default at any time.*
- *ROM based enhanced Epson and compatible printer dump.*
- *ROM based enhanced extended picture routine.*
- *Ability to create and abort extended pictures.*
- *Improved disk access speed for extended pictures.*
- *User definable sideways RAM driver for incompatible sideways RAM systems.*
- *Ellipses at any angle on Master 128 (or B with GXR ROM).*

ConQuest ROM Package	£30

(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

NEW

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro	£39

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible)	£45
RB2 including Quest Paint	£75
RB2-A for Archimedes	£52

THE NEW Mk III AMX MOUSE

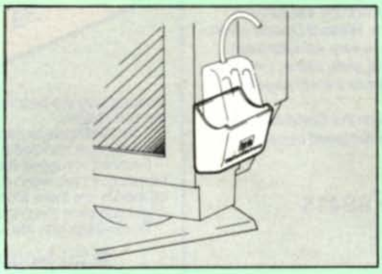
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

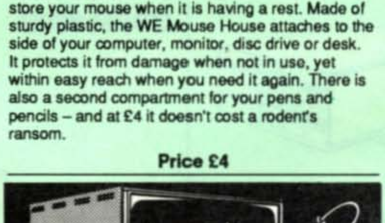
MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£20

WE MOUSE HOUSE



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk. It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.
This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.
Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.
Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.
Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional ★ commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it.
A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image. Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Magazine Maker

(As seen on TV)

A combination of Stop Press and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within Stop Press to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

With Stop Press's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Stop Press's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in Wordwise and View files plus much more.

Once created the picture can be printed out.

The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£135.00** (carr. £3)

WAPPING EDITOR
"MIGHTIER THAN THE QUILL"

The WAPPING EDITOR

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

PAGE LAYOUT SECTION

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module is a mode 0 version of the highly acclaimed Quest Paint package, detailed elsewhere in our advert, and incorporates all the same drawing facilities, e.g. pencil, brush, airbrush, polygon, circle, ellipse, fill, cut-and-paste, etc., etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

WORD-PROCESSOR

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

THE FONT EDITOR

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Upgrading to the Wapping Editor could not be easier since the font editor will convert fonts from other packages, such as Quest Paint or Stop Press (formerly Pagemaker), into Wapping Editor format and a mode conversion utility will convert any screen in modes 1, 2, 4 or 5 into a full grey-scale mode 0 screen. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser, either independantly or from within the Wapping Editor package.

For convenience all types of file may be stored on the same disc, with the software intelligently and transparently distinguishing between them. Filenames are picked off the screen with the mouse, dispensing with keyboard entry wherever possible.

"The Wapping Editor combines sophistication with ease of use and power with simplicity, to make it the most comprehensive and user-friendly DTP system ever likely to be written for the Beeb".

Wapping Editor Software Pack	£69
Wapping Editor plus Mouse	£89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

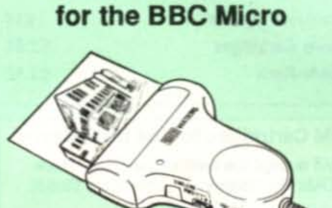
Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

The Beeb HandScan
Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

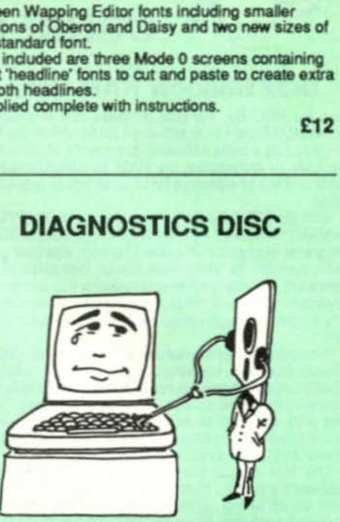
Beeb HandScan & Firmware £135

Wapping Font Disc

Sixteen Wapping Editor fonts including smaller versions of Oberon and Daisy and two new sizes of the standard font.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

(Only suitable for BBC B with 8271 DFS)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms see the feature in our advert.

NEW

Beeb DOS 2.2

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual.

Price: £39

(Please write in for technical literature)

Continued→ → → → → → → → →

ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as th printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

- Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£69** (carr. £2)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price:	Aries B-12	**£36**
	Aries B-12C	**£5**

ARIES B-488 IEEE-488 INTERFACE UNIT

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

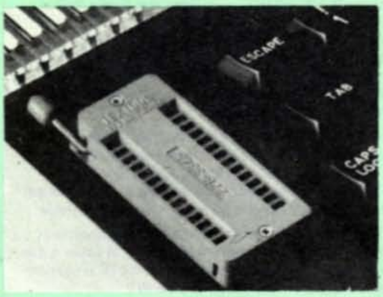
VOLTMACE JOYSTICKS

Delta 3B Single Joystick	**£10**
Delta 3B Twin Joysticks	**£15**
Delta 3C Joystick for Compact	**£10**
Delta 14B Single Joystick	**£11**
Delta 14B/1 Adaptor Module	**£12**
Transfer Software Disc-Tape	**£7**
Delta-Cat A mouse eliminator Joystick for the Archimedes	**£24**

Delta Base B

Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128	**£25**

SIDEWAYS ZIF SOCKET



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)
- BBC, B+ and Master compatible.

ONLY **£18** (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	**£11**
● Spare Cartridges	**£2.50**
● Spare Rack	**£1.50**

ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8;** Quad **£12**

16K DISC RAM

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances)
- Compact construction
- Supplied complete with Battery Backup.
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for profressional software development.
- Supplied with utilities software disc.

Only: **£32** (carr £2)

P.S. 16K Disc Ram Board is not designed to work in conjunction with a Sideways ROM Board.

SOLDERLESS SIDEWAYS ROM SOCKET BOARD

In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others – not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

- The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
- increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£9**
(carriage £2)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

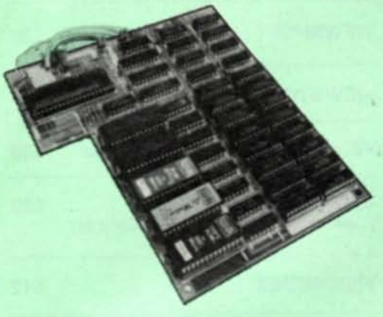
USER PORT SPLITTER UNIT

User Port Splitter
A
B

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22** (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 6 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO overheating problems.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- Accepts any ROM.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

Please write in for further details.

INTRODUCTORY PRICES:

● ROM/RAM card with 32k dynamic RAM	£48
● ROM/RAM card with 64k dynamic RAM	£65
● ROM/RAM card with a massive 128k dynamic RAM	£109

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

● 16k plug-in Static RAM kit	£9
● 16k Dynamic RAM for Upgrade	£13
● Battery backup	£3
● Read and Write protect switches	£2 each
Complete ROM-RAM board All options installed	£115

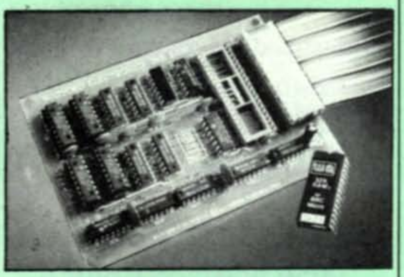
P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K

SHADOW RAM-Printer Buffer

Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

● IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

● "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.

● In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

● Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

● Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

● Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £2)
(Price includes a comprehensive manual
and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32k SHADOW RAM CARD and Computer Concept's INTERWORD Wordprocessor package.

at Only **£89** (Carr £2)

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms. See the feature in our advert.

BBC SOFTWARE'S
Popular Educational Software

● Maths with a Story 1 (Disc). 4 primary level maths programs	£11.25
● Maths with a Story 2 (Disc). 4 further maths programs.	£11.25
● Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.	£17.00
● RELATIONSHIP: Science (Disc) O-Level Biology program.	£20.00
● BONDING: Science (Disc) O-Level Chemistry program.	£20.00
● ELECTROMAGNETIC SPECTRUM (8 Discs) O-Level program.	£20.00
● ELECTRONICS IN ACTION (Disc) O-Level program.	£19.95
● NEWTON & THE SPACE SHUTTLE (Disc) O-Level program.	£20.00
● ECOLOGY (Disc) O-Level program.	£20.00
● POLYMERS (Disc) O-Level program.	£20.00
● Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.	£20.00
● FOOD & POPULATION (Disc) O-Level program.	£20.00
● MICROTECHNOLOGY (Cassette) O-Level program.	£11.25
● A VOUS LA FRANCE (2 Cassettes) A French language home study aid.	£21.70
● DEUTSCH DIREKT! (Disc & Audio Cassette)	£19.95
● Modem Master (Disc)	£11.25
● ADVANCED TELETEXT SYSTEM	£8.65
● PERIOD TABLE SOFTWARE	£20.00
● Astronomy – Primary (Disc)	£12.00
● Computers at Work – Primary	£17.35
● Introducing Geography – Primary	£17.00
● Introducing Geography 11-17 years	£17.50
● Electric Fields 6-14 years	£11.25
● Black Queen Contract Bridge	£13.00
● Espana Viva – 3 Discs	£19.95
● A Vous La France Disc	£21.50

Educational Software

FUN SCHOOL 2 – Red:

Under 6 yrs – 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic.

FUN SCHOOL 2 – Green:

6-8 yrs – Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump £11.00

FUN SCHOOL 2 – Blue:

Over 8 yrs – Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape. £11.25

Versatile BEEB SPEECH SYNTHESISER Unit

Beeb Speech Synthesiser

The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £2)

Continued→ → → → → → → → →

COMPUTER CONCEPT'S ROMS

ACCELERATOR	£30
CARETAKER Basic Utility	£23
DISC DOCTOR	£28
Graphics ROM	£29
TERMI	£25
COMMUNICATOR	£49

Wordwise £26

Wordwise plus £40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £42

Inter SHEET ONLY £37

INTER CHART ONLY: £25

Inter-WORD £36

MEGA-3 ROM

Interword, Intersheet & Interchart – 3 in one ROM £76

INTERBASE £49

All Prices Exclusive of VAT

MINI OFFICE II

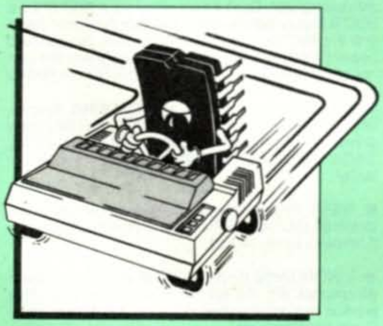
DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.50
DISC Version for the Compact	£18.00

(When ordering please specify for which Micro & 40 or 80 track Disc)

Advanced Computer Products

Advanced Disc Toolkit	£30
Advanced Disc Investigator	£25
Advanced 1770 DFS BBC	£29
Advanced 1770 DFS Master	£30
Advanced File Manager	£25
Advanced Control Panel	£30

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redifinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

VIEW 3.0 ROM	**£48**
VIEW PROFESSIONAL	**£59**
VIEWSHEET (Acornsoft)	**£36**
VIEWSTORE	**£36**
VIEWSPELL with 80 track disc	**£29**
VIEWPLOT Disc (Please specify for Master 128 or Compact)	**£20**
VIEW-INDEX	**£12**
OVERVIEW packs 1 & 2	**£69**

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc)	£8
Juki & Brother HR15 (Disc)	£8
Silver Reed Printers (Disc)	£8

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CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

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EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

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STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only **£21** (Disc)

OFFICE MATE

- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

SPREADSHEET – Offers many calculation and editing features

BEEBPLOT – Provides visual representation from Spreadsheet data.

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15 Hr Wordprocessing BBC/WW & WW+	£5.95
30 Hour BASIC (BBC Micro)	£12.95
Advanced User Guide for BBC	**£10.95**
Amiga Machine Lang. Guide	£19.95
Archimedes Assembly Language	£14.95
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference	£79.00
Assembly Language Prog. for the BBC	£10.95
Assembly Language Quick Ref.	£21.95
BASIC 2 – User Guide	£2
Basic V – A Dabhand Guide	£9.95
BBC Basic Guide (Archimedes)	£19.95
BBC BASIC – Mathematical Programs	£8.95
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VIEW Dabhand Guide	£12.95
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Viewstore User Guide	£10
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Z88 Computing	£9.95
Z88 Using Your	£9.95

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1-2-3 Mastering Release 3	£22.95
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WordStar 4.0 – Mastering	£20.45
Xerox Ventura Publishing – Inside	£27.95

The Advanced Reference Manual for the BBC Master

At last Acorn's long awaited Advance Reference Manual for the BBC Master Series of Microcomputers has now been published. Watford Electronics' own authors have edited and added missing sections to the original script and produced a very high quality publication.

It features information about:

- Memory Organisation
- Slow data bus
- Detailed circuit description
- Keyboard controller
- Screen display
- User port
- Serial processor
- Peripheral bus controller
- 1 Mhz Bus
- Machine operating system
- Second processors – Internal, Z80 and 80186
- Disc Filing Systems
- ANFS
- Terminal Emulator & Editor
- View internal format
- Detailed differences between Model B, B+, Master 128K and Compact
- Comprehensive appendix on 65C12 instruction set

At the rear of the manual there are pull out circuit diagrams for the Master 128K.
A worthwhile addition to any Master owner's library.

All this for just £17 (NO VAT)

NEW

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

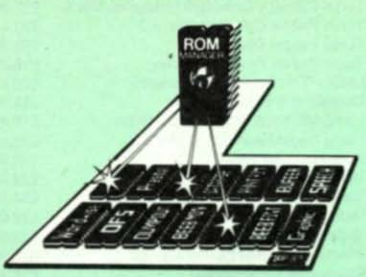
It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Continued→ → → → → → → → →

ROM MANAGER



Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs . Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.
"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

ADDER

The only low cost EPROM Programmer for the BBC Micro that will program both the standard 21V and the new 12V5, 27128 EPROMS.
Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.
The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.
The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.
Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: From 2K to 32K: 2516, 2716, 2532, 2732, 2764, 2764A, 27128, 27128A, 27256 (Both 12.5V and 21V).

£65 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs!
The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** – Standard version erases up to 16 chips. **£28** (carr £2)
- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£30** (carr £2)
- Spare UV tubes. **£9**

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This 415Ml, king size multi-purpose foam cleaner spray is ideal for cleaning the Keyboard, Monitor, Disc Drive and your computer furniture surfaces. Simply spray on the surface to clean and wipe off with a clean cloth.

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Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

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Aerosol Dust Spray

This simple to use aerosol spray is ideal for removing Dust and Dirt deposits from the Keyboards and similar inaccessible places. **£3**

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BBC Keyboard	£42	Speaker	£2
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UHF Modulator	£4	16MHz Crystal	£2
Speaker Grill	£1	17.734 MHz Xtal	£2
BBC Power Supply	£56	32.768MHz Xtal	£1
BBC B Refurbished Casing	£20	Master PSU	£59
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Replacement FLEXIBLE 17 way Keyboard Connector **£4**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

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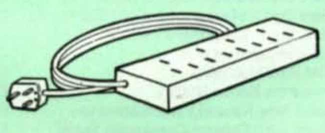

4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

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This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip. **£2**
Metal Chip Extractor **£3**

28pin DIL HEADER PLUG

SOLDER type **£1.50** IDC CRIMP type **£1.95**

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Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

28 pin ZIF SOCKET (Textool) **£6.95**

CREDIT CARD 24 HOUR
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(All ready made and tested)

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Supply from BBC power supply to standard Disc Drive connector.
Single **£3.00** Dual **£3.75**

DISC DRIVE INTERFACE LEADS
BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

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Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

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Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK **£8**

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DS88LS120	£5.25
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SAA5050	£8.75
UPD7002	£6.00
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27128A-250nS (12V5)	£3.00
27128-250nS (21V)	£4.50
27256-2	£3.99
27512-2	£5.75
27C101G (1 Meg)	£10.00
4013	60p
4020	£0.90
4164-15	£2.50
4464-12	£8.50
4464-15	£8.00
4816 RAM	£2.00
41256-15	£4.50
41256-12	£5.00
6264LP-8K	£4.25
6502A CPU	£4.50
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£3.40
6522A	£4.50
62256ALS-15	£10.00
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6818	£4.00
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68B54	£7.50
7438	40p
74LS00	25p
74LS04	25p
74LS10	25p
74LS123	80p
74LS163	70p
74LS244	80p
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74LS393	£1.00
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ICL7673PA	£2.00

ASSORTED ROMS

ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£45
Acorn LISP	£19
Acorn OS B+	£25
Acorn OS 1.2	£14
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BBC PCB Designer	£49
Beebfont	£25
Beebmon	£22
Buffer & Backup	£20
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Graphics Extension Rom	
GXR-B	£21
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ISO-Pascal Stand Alone Generator	£30
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MASTER OS ROM	£38
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Microtext Disc	£46
Nicrotext Rom	£199
NLQ DESIGNER	£25
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Numerator – BBC	£39
Pendown ROM	£32
ROMIT	£29
SERIAL ULA	£13
TED	£35
Termulator B, B+	£28
Termulator Master	£32
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39

The Aries IBM PC-XT 88 and Aries PC AT286 compatibles are now supplied with Digital Research's GEM, Microsoft MS DOS 3.30, GW-BASIC 3.21, the powerful Finesse 1.1 Desk Top Publishing package, Multiwriter WORDPROCESSOR & Spell-checker, PC Organiser and 12 months on site maintenance warranty. So you not only get the best all round value in PC compatibles, (£300+ worth of FREE Software & Hardware with every system), but you also get a complete and powerful WYSIWYG DTP software package that takes you from typewritten text onto typeset quality layouts. LOGITECH MOUSE too is included with the package. WATFORD GIVES YOU MORE FOR YOUR MONEY. (P.S. To operate Finesse DTP, you require a Hard Disc System).

ARIES PC-XT 88

ARIES PC AT 286

SPECIAL OFFER: THIS MONTH WE HAVE TWO SPECIAL OFFERS FOR YOU.

1. You may purchase Aries UPRIGHT XT88-UP and Aries UPRIGHT AT286-UP systems, (see photograph above) for the same price as the desktop PCs.
2. On XT & AT Systems 6 and Systems 7 we are able to offer 0% FINANCE. (For details telephone 0923 37774 Ext 203, 223 and 201).

Specification:

- 16 Bit Intel 8088-2 or NEC V20 78108 microprocessor, running at 8MHz or 4.77MHz. (3 times faster than IBM PC/XT).
- 8087-2 maths co-processor, optional.
- 640K minimum expandable to 1024K on system board, extra 384K RAMDISK available.
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- CLOCK on system board, gives non stop DATE & TIME.
- 8 expansion slots.
- 102 keys keyboard.
- RS232 with two ports
- 150W power supply.
- Mono graphics/parallel card (HERC Compatible).
- Legal BIOS and built-in games card and clock.

Specification:

- 80286 microprocessor.
- Optional 80287 Maths co-processor
- 640K RAM standard expandable on-board to 4MB.
- 1.2M Single Floppy (optional 2nd Floppy/3.5" Winny/T.Streamer)
- CLOCK on System board, gives non stop DATE & TIME.
- 8 expansion slots.
- 102 key keyboard
- Serial/Parallel Card.
- HDD/FDD Card
- Switchable Speed 8/12M Landmark test at 16MHz
- 200W power cable
- Mono graphics/parallel card (Herc. Compt.)
- Slide in metal case with function display.
- Legal BIOS and built-in games card and clock.

● FREE 12 month On-site Maintenance warranty (UK mainland) included in the price

Available in the following configurations:	PC-XT 88	PC-AT 286
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● *System 4 – As System 2 plus a 20MB Hard Disk fitted*	*£799*	*£995*
● *System 5 – As System 2 plus a 40MB Hard Disk fitted*	*£849*	*£1199*
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If your requirement is different, we will be pleased to quote for a system to your specific requirement.

Please telephone our PC department for price.

Prices subject to change without notice and available on request. ALL OFFERS subject to availability.

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CARRIAGE: Unless stated otherwise, minimum £1.50 on all orders. £3 on Larger items. On bulkier items, £7 Securicor charge applies (UK mainland only) Overseas orders, carriage is charged at cost

Specifications of all products are given in good faith but is subject to change without notice. Some items vary in their availability. Please ring for latest delivery situation.

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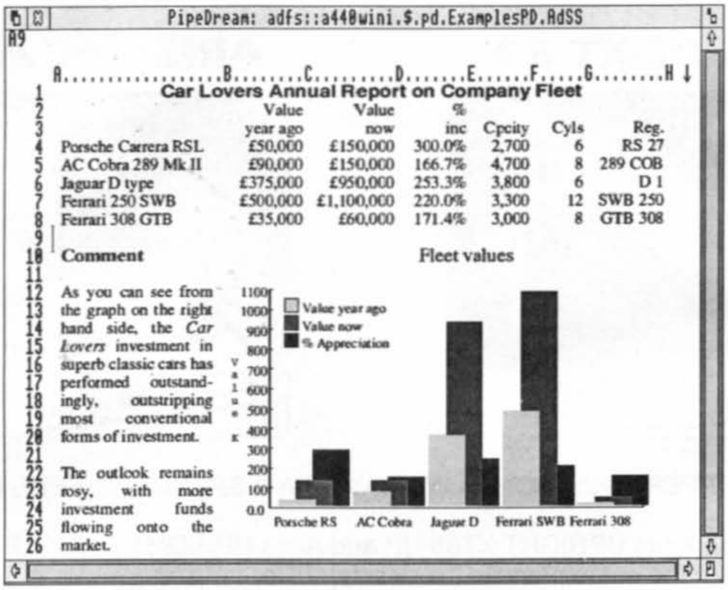
PIPEDREAM 3



Car Lovers Annual Report on Company Fleet

	Value year ago	Value now	% inc	Cpcity	Cyls	Reg.
Porsche Carrera RSL	£50,000	£150,000	300.0%	2,700	6	RS 27
AC Cobra 289 Mk II	£90,000	£150,000	166.7%	4,700	8	289 COB
Jaguar D type	£375,000	£950,000	253.3%	3,800	6	D 1
Ferrari 250 SWB	£500,000	£1,100,000	220.0%	3,300	12	SWB 250
Ferrari 308 GTB	£35,000	£60,000	171.4%	3,000	8	GTB 308

Comment

As you can see from the graph on the right hand side, the *Car Lovers* investment in superb classic cars has performed outstandingly, outstripping most conventional forms of investment.

The outlook remains rosy, with more investment funds flowing onto the market.

PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

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MU1

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

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Corrupt practices

The Mad Hatter investigates a really hellish game

THIS month – it still being the season of goodwill and all that – sees quite a lot of reader input. There's more to come too, so I'd like to take this opportunity to thank everyone who writes: Each letter is carefully read and – if you have enclosed a stamped, self-addressed envelope – answered, eventually.

The only thing that stops your name appearing in print is another reader beating you to the post with a hint, tip or query. So keep those letters rolling in, be patient while waiting for an answer, and who knows – it may be *you* who offers fellow adventurers help through this column.

So: Andy Mackintyre is the first reader to come up with some hints for the Archimedes adventure **Corruption**, and they are well worth passing on. Mr. Hughes' door can be opened by using the credit card, though it is advisable to wait till he has gone home at about 6 pm. You can then easily open his drawer using the screwdriver from the BMW glove compartment.

Getting out of hospital has foxed many people. You need to impersonate another patient – Mr. Davis – by getting the papers from his bed and wrapping the bandages found outside the surgery around your head. Collect the clothes and stethescope from the TV room and then lie down on the bed outside the surgery. Drop the clothes here and wait for the nice nurse to find you.

Instead of being murdered, you'll now find yourself in an ambulance and should get dressed quickly before it stops outside familiar surroundings. Once out of the ambulance, head south.

You can get into Mr. Rogers' office by using the brass key found in Theresa's office drawer. Behind the TV is a safe: Wear the stethescope and put it on the safe's dial. You should hear a thud, after which entering *Turn Dial* four times will open it.

Getting into the casino is a bit complicated. The gambling chips are no problem once the safe has been opened, but you need a matchbook as well.

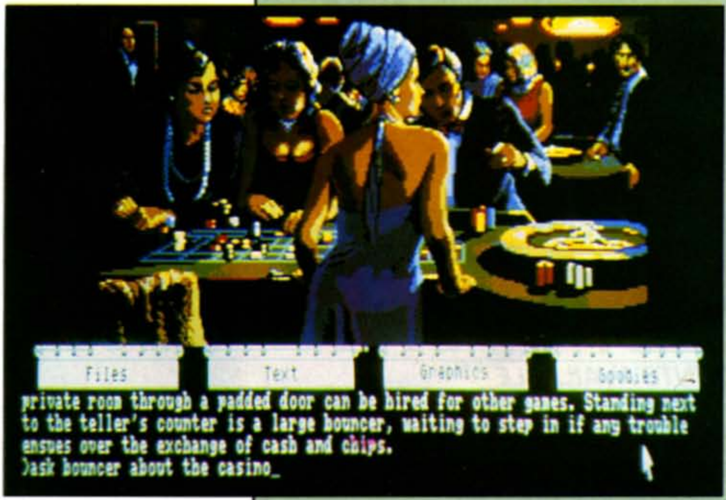
Get yourself arrested – try going to the police station and clouting the Sergeant – and you'll be incarcerated with a heavy-breathing type called McNally. I know him well. Summon up all your courage and thump him. He will then try to escape by bashing the sergeant and stealing the keys to the cell.

During this little rumpus McNally drops the matchbook, so grab it and follow him out of the police station. You can now go to Le Monaco and show the matchbook to the waiter. He will take you through the kitchen and out to the back yard. Provided you have the chips with you, knocking on the casino door will gain you admittance.

Finally, Andy has some advice on keeping possessions whenever you are arrested or otherwise offered unwelcome hospitality. Pack everything into your briefcase and leave it somewhere so that once you are discharged from hospital or jail you can return to where you left the case and retrieve it and your possessions.

Thanks, Andy. Now, can anyone tell him how to drive the BMW out of the car park? I tried for ages and still haven't mastered this one.

See you next month, until then, happy adventuring.



```
private room through a padded door can be hired for other games. Standing next
to the teller's counter is a large bouncer, waiting to step in if any trouble
ensues over the exchange of cash and chips.
)ask bouncer about the casino_
```

Corruption: In the casino

It's no lemon

For the start of this section of that excellent adventure **Progammer's Revenge** you should once again be standing in the hall of the house. Pick up the lemon – a hand-grenade in disguise – before leaving.

Now go N, N, N, NE, SW, and N to the canyon before proceeding (carefully) NW, S, SE and SW into the sandpit. Next, go SE and drop the lemon down the drain (honest) and then go E and S into the tiny cave where you'll see a chest of contraband. Take it and move N and W and then drop the contraband here.

Now head E, E and S and double check that you are carrying nothing before moving SE into the rockpool. Move S, S and E up the bank, then SE, W, W, SW and E to the folly. Go up twice and take the chain from the cupola.

From here you should return to the clearing and then continue W to the sensible (?) building and S into the maze of round rooms. Follow the course W, E, N, N, SW, E, W, NW, SW and SE to locate the stereo – which you should take and then go D the pole into the sensible building.

Now you must go N and NE and then – be bold – continue W until you are up to your neck in the sewage pipe. Here you'll find the lemon and contraband awaiting you. Take them, return E as far as the ladder and climb up into the waterworks.

Move up again and take the putty before going D again then SE, E and Up into the control room. Push the lever to be found here, go back D and make your way E through the door to the generator room, which is now open, and take the uranium.

Next travel W, W, S and E up the steps and turn tap three times so that the troll in the gas room can get his comeuppance. Now go W and then keep going S until you reach the trapdoor. Throw the lemon here and it will open. This sequence was to kill time so that you don't get killed by entering the gas room too soon.

So now go N, N, and E and take the pipe and return once more W and S until you reach the trapdoor. Go up here, and blow me down if you aren't back in the house.

Drop the uranium (11 points), contraband (10), chain (11), stereo (20) and pipe (9) before returning to the hall where you should drop the putty and gird yourself for further action.

To be continued.

Elite trading standards?

Andrew Hardwick has added to the information given last month by Andrew Gilmore on laser purchase in **Elite**. If you try to buy lasers when you already have them the effect on your bank balance varies according to the type of laser. Thus, pulse lasers gain you Cr. 200, beam lasers *lose* you Cr. 339.9, military lasers likewise lose you Cr. 667 and – as we already know – mining lasers gain you a fat bonus of Cr. 3570.3.

Andrew has one problem, concerning Mission One. Old hands will know that the Constrictor uses galactic hyperspace after leaving Reesdice (Galaxy 1). What you *must* do is follow suit: Hyperspace to Galaxy 2 and head for Cearso. What puts many people off is the fact that Cearso is an Anarchy system. That can't be helped – if you don't go there you can't continue the mission.

Paul Fitzgerald from New Zealand issues a timely reminder, too: Once you have finished Mission One it is advisable to move on to Galaxy 3 immediately, because it is there that mission two is triggered in due course.

Ashish Meswani reckons that the reward for successfully completing mission two (a naval energy unit) is a bit stingy. He wonders if there are any more missions. The answer is, regretfully, no so far as the BBC Micro version is concerned.

Problem Corner

David Shepherdson is another reader who is stuck in **Castle Dracula**. How can he get past the suit of armour or Quasimodo or the rubble which obstructs three of the staircases?

Todd Newman would like to know how to deal with the zombie and how to get the garlic in the same game. He also would like to know what to do in **Hareraiser (Prelude)** by Haresoft: This is a game I've never even heard of before, so over to you, dear readers.

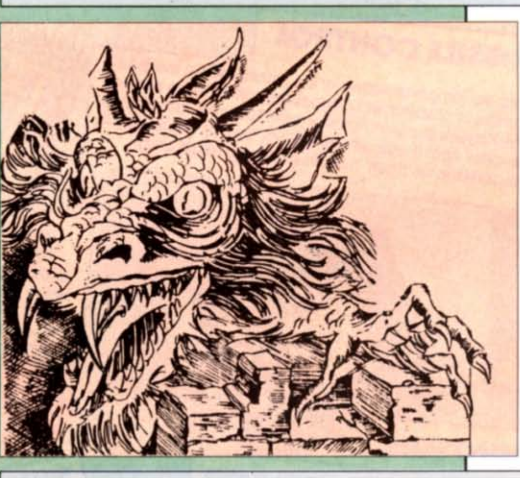
I haven't had time to finish **American Suds** yet, and Richard Sillitto wants to know how to get past the dog in Part 3. Can anyone help, please?

A cry for help from Graham Watt, who has been playing Infocom's **Hitchhikers Guide to the Galaxy** and would like to know how to get off the ship *Heart of Gold*. No-one has sent me this for review on the Archimedes yet, so is there a lucky adventurer out there who can help Graham?

Peter Doyle would like hints, tips and advice on **Warlord of Doom** by Visions. How can he avoid being decapitated by the knight on horseback, barbecued by the dragon and duffed up by the genie once it is out of the bottle?

Could some kind reader send me a solution the Program Power's **Adventure**? As you know, I don't have the game and here is Stuart Newton wanting to know where to find the water so that he can water the plant outside the dungeon. He also wants to how to return to the cave network once he has gone to the dungeon. And, of course, we have just had Todd Newman wanting answers to a problem in **Adventure**, though that was – as it happened – a non game-specific problem.

Stuart Newton would also like to know what to do in **Five Spheres of Goliath** once he has taken them to the console, and again, the only reader-supplied help that I have been sent doesn't deal with that particular problem.



Hatter's Helpline

Richard Sillitto is stuck in several adventures. In **Time Machine** he can't get off the moors. He needs to move north, west and south.

In **Wizards Challenge** he can't get past the bully. Try bribing him with a sweet. He can't get into the maintenance wagon in **Circus** either. Try opening the door first.

Todd Newman has problems with the maze in Program Power's **Adventure** as he can't carry enough objects. I hope he read last month's column on maze-solving – it's all there.

Further problems are encountered by Todd in **Dodgy Geezers**. Wait till Friday afternoon, then go to the building site and get George's pickaxe. On Friday evening go to the Frog and Peach and wait till the phone rings and then answer it.

THE M·I·N·E·R·V·A COLLECTION

Archimedes Games

JET FIGHTER

Alone on a forgotten planet you must defend yourself against all comers whilst rebuilding your broken rocket ship, then fuel it and take off to the next level. With the aid of your jet-powered backpack you move around to collect the various parts of the rocket. You must avoid collision with all other objects. Build and then fuel your rocket to take off to the next level. Absorbing fun for all the family.

THUNDERMONK

An intriguing new game with a variety of ways to achieve the ultimate goal of recapturing the Lonesome Monk's Monastery from the grip of the Evil Demons. Lead The Lonesome Monk's army through the labyrinths of the Monastery and recapture all the great treasures hidden in the building. Keep your eyes peeled for the secret passages. You too could walk through walls!

FREDDY'S FOLLY

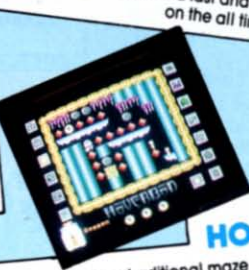
An enchanting game using animated graphics. Just watch the little men load the canon and pull it along. Notice the celebration when they win! Colourful fun for all the family. Sir Freddy is sneaky and envious of your castle so plans to bomb it with a fleet of balloons. You built a battlement to shoot down Sir Freddy in his balloon. Sir Freddy then hired several Gun ships to shoot your canon crew. Defend your castle and shoot down the balloons and the invading ships.

ORION

Skillfully manipulate Orion, the latest air to air combat interceptor, to defend your planet against the tide of marauding aliens. Shoot them down before its too late! Score points by saving your men before they are changed into mutants –otherwise they will turn against you. Contains Baiters, Pods which explode into Swarmers and waves of Bombers. Orion is a fast and furious scrolling 'shoot em up' game based on the all time arcade classic.

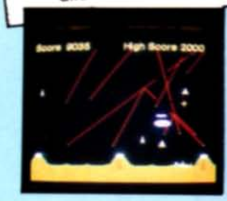
MISSILE CONTROL

Missile Control is a classic arcade game written for the Archimedes to make full use of the advanced graphics and sound, while remaining faithful to the original concepts of the game. The Player is in control of the missile launches and must do the utmost to protect the cities from the incoming missiles. On each subsequent attack further planes, satellites or 'smart' missiles attack the target cities.



HOVERBOD

Hoverbod is a traditional maze adventure in the style of the classic Manic Miner, yet it is of stupendous proportions. Hoverbod, the yellow sperical droid, has been banished from the planet Zingle and goes in search of some stolen treasure. The player must guide him through the perils which befall him and help him puzzle his way through the eight different levels to the final quest level. But beware . . . the Ibbles and Squibbles start to materialise!!!!



MINOTAUR

The Minotaur maze game is aimed at a market for children or adults who want a game where quick shoot-out reactions are not necessary. Theseus walks around the Labyrinth, collecting items to assist in the search of the ill fated men which have been provided as food for the Minotaur. The ultimate aim is then to kill the Minotaur and lead the men out of the Labyrinth to safety. The maze size is fully definable by the User. Games may be saved and reloaded for use at a later time.

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From screen to paper

Bruce Goatly finally puts it all together

DURING the past three months we have been looking at two of the ingredients that go to make up a document in desktop publishing. You should by now have prepared some text and graphics in readiness for the great day of assembly, so now let's see how they can be put together to form a seamless product. All it will take is some time, some care and the magic of a third ingredient, design.

Let's be quite clear about this, design is an art, not a science. It's hard to define the precise difference between a design that works well and one that doesn't quite make it. Look, for example, at the two versions of *Teenage Times* in the DTP Surgery in the October issue of *The Micro User*. The original layout was fine as it was, but you can see how redesigning it improved its appearance.

The paradox about design is that the more trouble you take the less the reader should be aware of it – but it will be obvious if you ignore it. You can't expect DTP to make you an expert designer, but most of the software available has various aids to help you achieve a pleasing result.

So the first general design tip is this: Use the design tools provided and plan your publication in rough before you start. Use the on-screen rulers, grids and preview facilities to balance each page. On the 8 bit BBC Micros Stop Press, Pixel Perfect and Wapping Editor have guide rules and previewing, and on the Archimedes both Acorn DTP and Impression have accurate location techniques.

To start with, your design will be largely determined by what sort of publication it is – poster, magazine, newsletter, brochure, book – and the visual impact of each needs to be different. So the second point is: Ask yourself how you want to relate to your reader.

Do you want the message big and bold or small and subtle? Should there be lots of white areas or lots of black? Should it be visually exciting with plenty of flashes and bangs, or will the text carry the message?

Decisions, decisions. Each one leads to another, and before you know it the thing has designed itself. Or has it? Step back occasionally and look at it afresh. Do you really need to use 10 different typefaces? Two-inch type is fine for a headline, but how much of it do you need? Shouldn't that picture be bigger than a postage stamp, and not dead centre on the page?

If you are designing a series such as a regular

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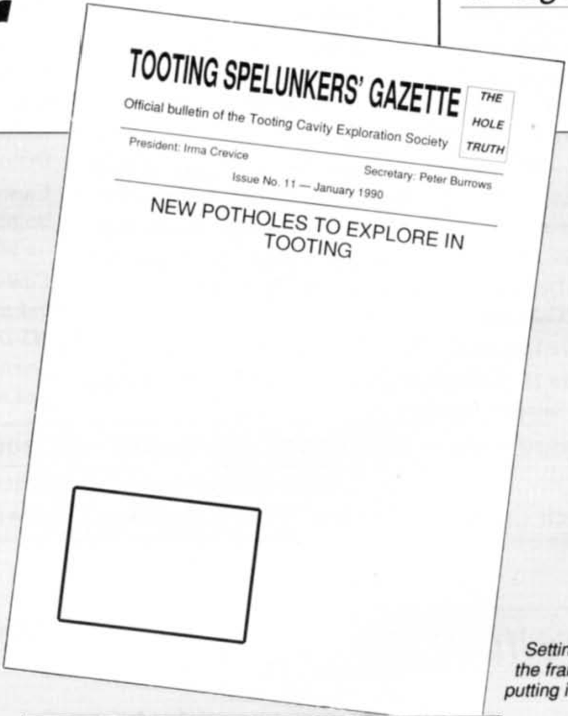


TOOTING SPELUNKERS' GAZETTE

THE HOLE TRUTH

Official bulletin of the Tooting Cavity Exploration Society

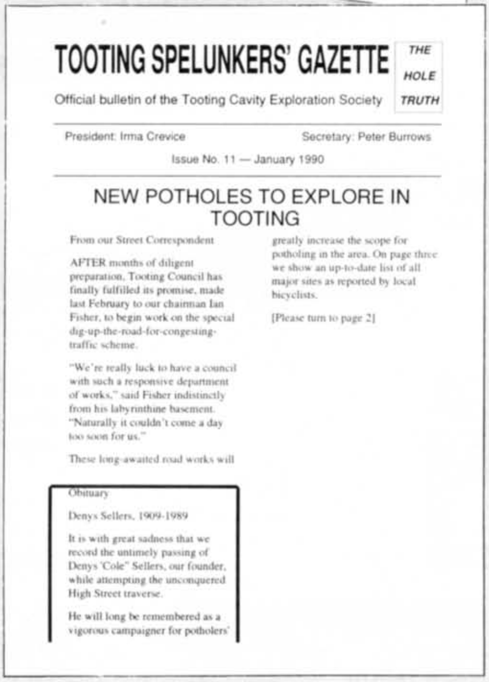
President: Irma Crevice

Secretary: Peter Burrows

Issue No. 11 — January 1990

NEW POTHOLES TO EXPLORE IN TOOTING

Setting up the frames and putting in the titles



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Issue No. 11 — January 1990

NEW POTHOLES TO EXPLORE IN TOOTING

From our Street Correspondent

AFTER months of diligent preparation, Tooting Council has finally fulfilled its promise, made last February to our chairman Ian Fisher, to begin work on the special dig-up-the-road-for-congesting-traffic scheme.

"We're really luck to have a council with such a responsive department of works," said Fisher indistinctly from his labyrinthine basement. "Naturally it couldn't come a day too soon for us."

These long-awaited road works will greatly increase the scope for potholing in the area. On page three we show an up-to-date list of all major sites as reported by local bicyclists.

[Please turn to page 2]

Obituary

Denys Sellers, 1909-1989

It is with great sadness that we record the untimely passing of Denys 'Cole" Sellers, our founder, while attempting the unconquered High Street traverse.

He will long be remembered as a vigorous campaigner for potholers'

Newly imported text, in basic style

More Archimedes Shareware Discs!!

Here is a selection from our range of public domain program discs. Send an S.A.E. for a full list.

Shareware 2: DFS reader, backup and archiver, 9 graphics demos, 256 colour Sprite Editor, CMOS ram Editor, Disc Copier, LQ printer Font Definer, Matrix Functions, BASIC Fast Screenload, Connect Four, Mastermind, Solitaire and Star Trek.

Shareware 5: Fifty-one pieces of music for Maestro.

Shareware 7: A disc database of Archive magazine plus data files for Archive, Risc User and Beebug.

Shareware 10: Address book database, 4096 colour selector, expenses manager, Reversi game, Star Trek, a simple 3D volume of rotation program and 29 astronomical programs.

Shareware 11: Six concerti in Maestro form.

Shareware 12: Descent to Xeer, Rubik's cube, BASIC compressor, Sinclair QL disc reader, Central heating calcs, Making cassette inlays, Floppy drive speed test, Address book.

Shareware 13: Hard disc backup, Rubik's clock, Interrupt module, Dustbin, Outline processor, Mandelbrots, Video database, Calendar, Golf.

Shareware 14: 'Arctist Plus' – 256 colour art package.

Shareware 15: 14 graphics demos, 2 !Draw fonts, 6 !Maestro tunes, 20 Sampled sounds.

***Shareware 16**: (another) 256-colour art package, link to Psion organiser, YAIG-2 game (works in the overscan mode).*

***Shareware 17**: Acorn's RISC-OS extras disc: new printer drivers; new version of !65Host; improved NetFS, NetPrint, NetFiler and NetStatus; IRQ latency fix; new hourglass and sound modules; WimpUtils module; new Clib (3.50), Colours (0.52) and FPEmulator (2.80).*

Careware 1: Calendar, Label Printer, "Make" utility, Othello, Sliding block puzzles, Simon, various small demos & games.

Careware 2: Asteroids, Backgammon, Fractal curves, Desktop Calendar, ARM disassembler, Disc editor (ADFS & MS-DOS), Icon for BASIC editor, BASIC program compressor.

Careware 3: Breakout, Fruit machine, 3D O's&X's, Forth language, Hard Disc backup, Graphical file dump, 'Examine' for MS-DOS, and (another) Icon for BASIC editor.

***Careware 4:** graphics animation by Malcolm Banthorpe, serial link to BBC micro, dustbin, !PCdir – converts files to and from MS-DOS, screen blanking routine, WP file conversion routines, function key strip printer, some more tunes for use with Maestro and some desktop demos.*

Shareware – £3.50 each, Careware – £7 each (N.B. ALL £7 goes to charity).

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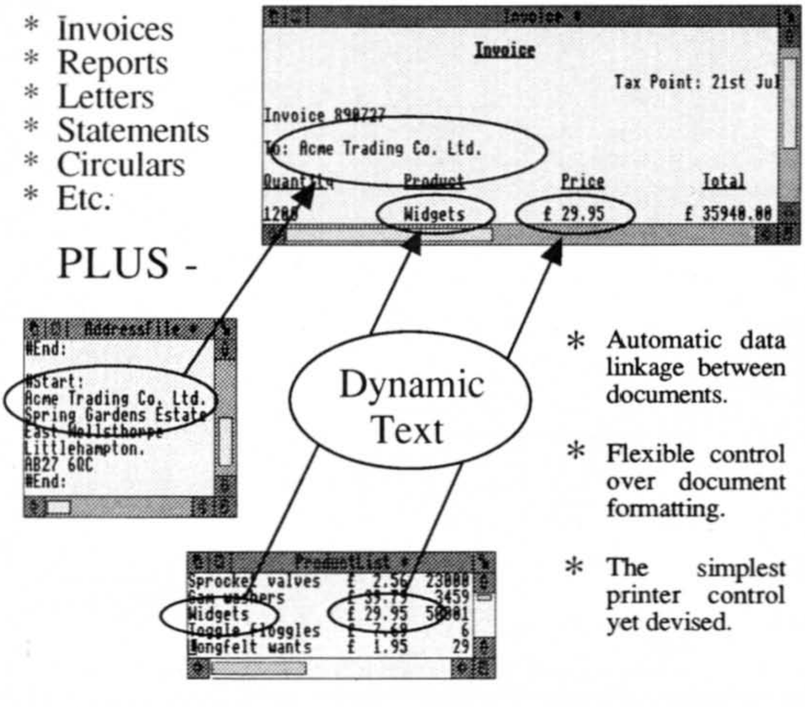

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Existing customers may upgrade free of charge, simply by returning their current disc. Alternatively, a complete upgrade is available including the new word processor manual and thesaurus, for £17.35 + VAT.

Premier 3 may be purchased directly by phone, quoting your MasterCard (Access) or Visa card number, or from your nearest Acorn dealer. Educational discounts and multi-machine licences are available.

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newsletter or a magazine, set up a style file which will help you plan each issue along similar lines, rather than having to start from scratch each time.

These points are all to do with balance – the overall look of the publication. But there are also finer details to consider if you are expecting someone to read a mass of text.

Look at this page. It is well laid out, with a good use of white space and printed areas, and you can always tell where you are and where to go next. The type size is in good proportion to the line length, avoiding large open spaces between words, and reading it is easy on the eye.

You should always remember that your reader has a choice – to read your work or ignore it. Make your text inviting to look at. Break it up with cross-headings if there is a lot of it.

Don't be extravagant, with too many different visual ideas jostling for attention. Use rules, ornaments or borders if you like, but don't clutter. Keeping things simple can also be very effective.

Another thing to remember is that your printer has limitations either of resolution – how small the dots it can print are – or paper size. A printer usually has a better resolution than a monitor screen, but even that may be too coarse for text you want to be read in bulk.

One way round this is to print the document at larger than the final size and have it reduced photographically during duplication to enhance the fineness of detail. Reducing an A4 page to 71per cent will make it A5, a suitable size for a booklet or even a book. Alternatively, if boldness is your aim you can enlarge an A5 page to 141per cent to make it A4, or an A4 one to A3.

All this may sound rather dull and academic, but it is all important. More readers get turned off by poor design than you might think.

So much for the theory – what about the mechanics of assembling a page? Given the range of machines and software this series has covered, it isn't practicable to give more than general guidelines here.

First let's assume you have the overall layout sketched out roughly and that your page consists of more than just plain text all the same size, although DTP can happily be used for that too.

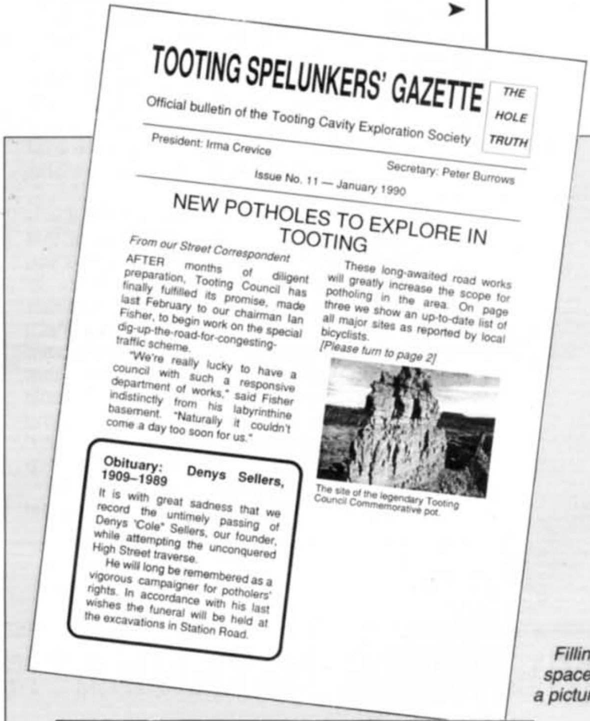
If you have a graphic-based DTP program, as defined last month, the only way to move things around the page is by cutting and pasting. This effectively removes the selected item to a clipboard, from which it can be pasted back on to the page in a new location. This can be a bit slow and initially hit and miss.

The dynamic DTP packages have one or more clipboards too, but they are mainly used to carry items from one page to another because frames can be pushed around a single page with ease. Keep these distinctions in mind wherever you see the word "move" in the rest of this article.

If there is to be an overall title for the page get that done first because it will presumably be a prominent feature. You may have drawn it to be included as a graphic cutout, or it might be typeset like a heading. Again, it could be a mixture of the two. After you've worked on it close up, study it in the context of the whole page size – does it have enough impact without being overwhelming?

Next add a piece of text – we saw last month how you can specify where the text should go, so see how much space the first bit occupies.

➤



TOOTING SPELUNKERS' GAZETTE

THE HOLE TRUTH

Official bulletin of the Tooting Cavity Exploration Society

President: Irma Crevice

Secretary: Peter Burrows

Issue No. 11 — January 1990

NEW POTHOLES TO EXPLORE IN TOOTING

From our Street Correspondent

AFTER months of diligent preparation, Tooting Council has finally fulfilled its promise, made last February to our chairman Ian Fisher, to begin work on the special dig-up-the-road-for-congesting-traffic scheme.

"We're really lucky to have a council with such a responsive department of works," said Fisher indistinctly from his labyrinthine basement. "Naturally it couldn't come a day too soon for us."

These long-awaited road works will greatly increase the scope for potholing in the area. On page three we show an up-to-date list of all major sites as reported by local bicyclists.

[Please turn to page 2]

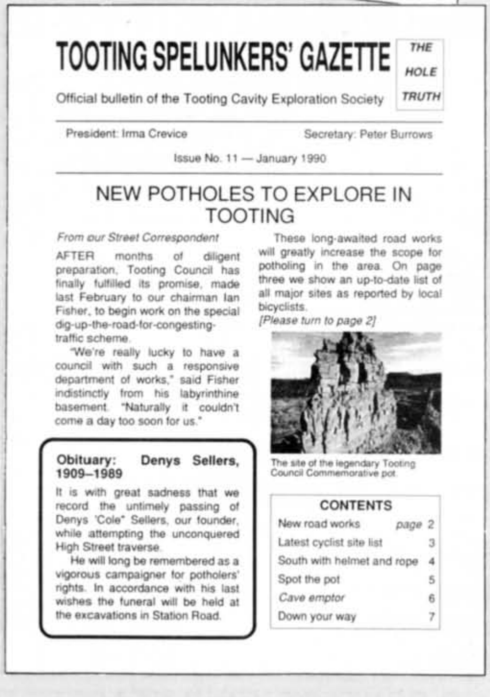
The site of the legendary Tooting Council Commemorative pot.

Obituary: Denys Sellers, 1909–1989

It is with great sadness that we record the untimely passing of Denys 'Cole' Sellers, our founder, while attempting the unconquered High Street traverse.

He will long be remembered as a vigorous campaigner for potholers' rights. In accordance with his last wishes the funeral will be held at the excavations in Station Road.

Filling spare space with a picture



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New road works	*page* 2
Latest cyclist site list	3
South with helmet and rope	4
Spot the pot	5
Cave emptor	6
Down your way	7

The finished page

➤

You might think of changing the font size if the text doesn't fill the expected area, but you may be better off rethinking your allocation of areas, because text size should normally be consistent throughout.

Have you left enough room for titles or headlines? Put one in and find out. Now look again at the page overall, and move or resize items as necessary. Add more text and another heading.

If you haven't already done so, get into th habit of saving your work to disc regularly, if it isn't saved automatically on scrolling or previewing. It's truly agonising to see hours of work disappear without trace because you've just pressed the wrong key or there's been a mains glitch.

Are you going to include a picture? Put it in – you can always move it later. Don't forget that text can be set to flow round an illustration if you want variety – for this, put the picture in first.

Is the size of the picture right? If you can correct it by cutting bits off – cropping – then that's easy. If it needs changing in size you could have a problem. Graphic DTP programs have more restricted resizing capabilities than the dynamic ones, and of the 8 bit software only Wapping Editor has a generalised enlargement and reduction option, which it calls distort – the others restrict you to doubling or halving the size.

If you've nearly finished the page and the text still doesn't quite fill the space allowed, a trick of the trade is to add cross-headings. These are single lines set in larger and generally bolder type scattered through the text. Single words or short phrases from the story will do – they're really only there for show.

About now you might have realised that this is a jigsaw with no unique solution and be wondering if it wouldn't just be simpler to get out the scissors and glue again. Persevere – with practice you can make up a page much more accurately and consistently on screen than on paper.

That should be the hard part over. Now it's mostly downhill to the finish line. After final checks on the overall look of the page on screen you can print out your first page. If you have the option of a draft printout, choose it. It saves on printer ribbons and time, though not on paper.

Don't be too surprised if your first attempt doesn't look quite as you had imagined it – experience is a great teacher. Before long you'll become expert at using previewing to save on printouts.

Most importantly, you should remember that it has all been done before. Others have asked themselves the same questions, had the same doubts and struggles, been driven to the same compromises and ended up with a successful design. So take heart, look at existing specimens in your chosen genre and choose from them the ideas that you want to use. It's fun – and you don't get gummed-up fingers.

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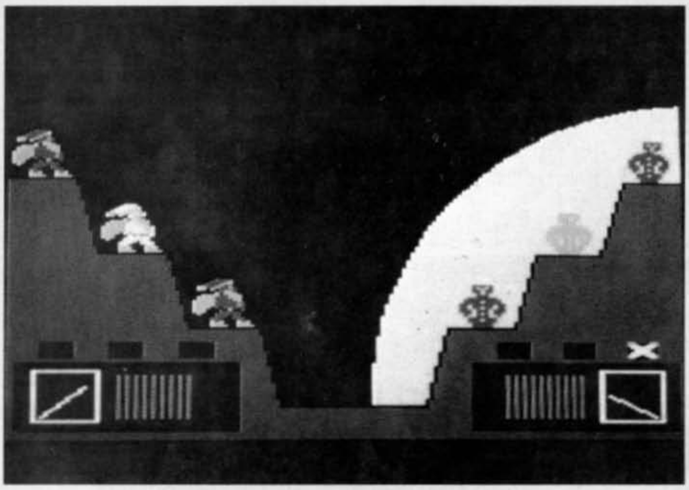

◀ From Page 49

```
   10 REM >Revenge of the Snowmen
   20 REM Jonathan Perry and Pali Rao
   30 REM (c) The Micro User
   40 PROCreloc(&E00)
   50 ON ERROR MODE7:REPORT:PRINT" at li
ne ";ERL:END
   60 MODE7:VDU23,1,0;0;0;0;
   70 PROCins:MODE130
   80 VDU5:VDU23,1,0;0;0;0;
   90 PROCscr:PROCgam
  100 GCOL0,1:MOVE192,768
  110 PRINT"Another (Y/N) ?"
  120 REPEATA%=INSTR(">Nn",GET$)
  130 UNTILA%>0:IF A%<3 RUN ELSE END
  140 DEFPROCinit
  150 DIMa$(4),x(7),y(7),sa%(2),sn%(2)
  160 DIMa%(1),s%(1),p%(1),sh%(1),fs%(1)
  170 DIMt%(1),ff%(1),px(1),py(1),ix(1),
iy(1)
  180 FORI=0TO1:a%(I)=7:sh%(I)=3:NEXT
  190 FORI=0TO2:sa%(I)=1:sn%(I)=1:NEXT
  200 ENVELOPE1,10,28,20,-48,1,1,1,126,-
1,-1,-1,126,0
  210 ENVELOPE2,2,-8,0,0,100,1,1,8,-1,0,
-1,80,80
  220 ENVELOPE3,3,0,0,0,0,0,0,126,-4,-2,
-4,126,100
  230 ENVELOPE4,3,0,0,0,0,0,0,80,-2,-2,-
2,80,40
  240 end=FALSE:nigh=TRUE:PROCchars
  250 DIMs(18),c(18)
  260 FORT%=0 TO 90 STEP 5
  270 s(18-T%/5)=SINRADT%
  280 c(18-T%/5)=COSRADT%:NEXT
  290 grav=-.15:wind=RND(1)/40
  300 IFRND(2)=1 wind=-wind
  310 ENDPROC
  320 DEFPROCins
  330 PROCd(1,8,1,"Revenge of the Snowme
n")
  340 PROCd(4,16,8,"Santa")
  350 PROCd(4,26,8,"Snowman")
  360 PROCd(2,7,11,"Angle :"+STRING$(4,"
 ")+"A"+STRING$(10," ")+"]")
  370 PROCd(7,7,13,"Speed :"+STRING$(4,"
 ")+"S"+STRING$(10," ")+":")
  380 PROCd(2,4,15,"Position :"+STRING$(
3," ")+"Tab"+STRING$(7," ")+"Up/Dn")
  390 PROCd(7,8,17,"Fire : CPS/CTL"+STRI
NG$(4," ")+"Return")
  400 PROCd(2,6,19,"Shield :"+STRING$(4,
" ")+"Z"+STRING$(9," ")+"Copy")
  410 PROCd(6,4,22,"Press Space to conti
nue...")
  420 PROCinit:REPEATUNTILGET=32:ENDPROC
  430 DEFPROCchars
  440 VDU&E017;&7F7F;&7F7F;&7F7F;&7F7F;
  450 VDU&E117;&FFFF;&FFFF;&FFFF;&FFFF;
  460 VDU&E217;&303;&807;&100;&101;
  470 VDU&E317;&8080;&20C0;0;0;
  480 VDU&E417;0;&700;&605;&206;
  490 VDU&E517;0;&C000;&C040;&80C0;
  500 VDU&E617;&F03;&1E1F;&373F;&3B36;
  510 VDU&E717;&E080;&F0F0;&D8F8;&B8D8;
  520 VDU&E817;&1A3B;&F13;&F0E;&707;
  530 VDU&E917;&B0B8;&E090;&E0E0;&C0C0;
  540 VDU&EA17;&703;&1E0F;&10D;1;
  550 VDU&EB17;&8080;&C000;&E0A0;0;
  560 VDU&EC17;&301;&303;&303;&102;
  570 VDU&ED17;&8080;&E8C0;&E8F8;&8F8;
  580 VDU&EE17;&301;&703;&206;0;
  590 VDU&EF17;&F0F0;&38B0;&818;0;
  600 VDU&F017;0;&100;&3432;&200;
```

	Santa	Snowman
Angle	A	]
Speed	S	:
Position	Tab	Cursor up or down
Shield	Z	Copy
Fire	Control or Caps Lock	Return

```
  610 VDU&F117;&4000;&C0;&40;&E0C0;
  620 VDU&F217;&3C1E;&7C3C;&7C7C;&7078;
  630 VDU&F317;&7070;&1030;&1000;&4000;
  640 VDU&F417;&2070;0;&500;&707;
  650 VDU&F517;0;0;&1400;&9E1C;
  660 VDU&F617;0;&3C18;&183C;0;
  670 VDU&F717;&E7C3;&3C7E;&7E3C;&C3E7;
  680 a$=CHR$8+CHR$8+CHR$10
  690 a$(0)=CHR$224+CHR$225+a$+CHR$224+C
HR$225+a$+CHR$224+CHR$225
  700 a$(1)=CHR$226+CHR$227
  710 a$(2)=CHR$234+CHR$235+a$+CHR$236+C
HR$237+a$+CHR$238+CHR$239
  720 a$(3)=CHR$228+CHR$229+a$+CHR$230+C
HR$231+a$+CHR$232+CHR$233
  730 a$(4)=CHR$240+CHR$241+a$+CHR$242+C
HR$243+a$+CHR$244+CHR$245
  740 b%=246:ENDPROC
  750 DEFPROCscr
  760 FORI=0TO15:VDU19,I,0;0;:NEXT
  770 VDU19,5,1;0;:GCOL0,5:MOVE192,768
  780 PRINT"Drawing screen":MOVE0,64
  790 org=0:FORI=0TO1
  800 GCOL0,14+I:FORang=0TO18
  810 xc=608*c(ang):yc=64+608*s(ang)
  820 IFI=1xc=1280-xc:org=1280
  830 MOVEorg,64:PLOT85,xc,yc
  840 NEXT:MOVE1280,64:NEXT:GCOL0,6
  850 FORI=0TO7:READx(I),y(I):NEXT:C=0
  860 FORI=0TO6:MOVEx(I),0:MOVEx(I+1),0
  870 PLOT85,x(I),y(I)
  880 PLOT85,x(I+1),y(I+1)
  890 GCOL0,4:MOVEx(I),y(I)
  900 DRAWx(I+1),y(I+1):GCOL0,6:NEXT
  910 IFC=0C=1:FORI=0TO7:x(I)=1280-x(I):
NEXT:GOTO860
  920 PROCpiece:PROCdisp
  930 FORI=0TO7:VDU19,I,I;0;:NEXT
  940 FORI=8TO13:VDU19,I,6;0;:NEXT
  950 VDU19,14,0;0;19,15,0;0;19,5,0;0;
  960 Z%=RND(-TIME):FORI=0TO1
  970 FORJ=5TORND(15):PROCangle(I):NEXT
  980 FORJ=5TORND(15):PROCspeed(I):NEXT
  990 FORJ=5TORND(15):PROCpos(I):NEXT
 1000 NEXT:ENDPROC
 1010 DATA0,512,128,512,170,362,298,362
 1020 DATA340,212,468,212,510,62,640,62
 1030 DEFPROCpiece
 1040 FOR I=0 TO 2:GCOL 0,8+I
 1050 MOVE I*170,608-I*150:PRINTa$(2)
 1060 GCOL 0,7:MOVEI*170,608-I*150
 1070 PRINTa$(4):GCOL 0,1
 1080 MOVE1160-I*170,608-I*150
 1090 PRINTa$(1):GCOL 0,11+I
 1100 MOVE1160-I*170,608-I*150
 1110 PRINTa$(3):NEXT:ENDPROC
 1120 DEFPROCdisp
 1130 PROCb(4,16,16,424,144)
 1140 PROCb(4,856,16,1264,144)
 1150 FORI=0TO68STEP4
 1160 PROCb(0,24+I,20+I,416-I,140-I)
 1170 PROCb(0,864+I,20+I,1256-I,140-I)
 1180 NEXT:PROCb(1,48,32,168,128)
 1190 PROCb(1,1232,32,1104,128)
 1200 GCOL0,0:FORI=0TO2
 1210 MOVE64+I*128,184:VDU225
 1220 MOVE904+I*128,184:VDU225:NEXT
 1230 ENDPROC
 1240 DEFPROCb(C,x1,y1,x2,y2)
 1250 GCOL0,C:MOVEx1,y1:DRAWx2,y1
 1260 DRAWx2,y2:DRAWx1,y2:DRAWx1,y1
 1270 ENDPROC
 1280 DEFPROCgam
 1290 REPEAT Z%=RND(-(ABS(RND+1))):*FX15
 1300 IFff%(0)=0PROCc0 ELSEPROCm(0)
 1310 IF end ELSEIFff%(1)=0PROCc1 ELSEPR
OCm(1)
 1320 UNTILend=nigh:ENDPROC
 1330 DEFPROCc0
 1340 IFINKEY-82PROCspeed(0)
 1350 IFINKEY-20RINKEY-65PROCfire(0)
 1360 IFINKEY-66PROCangle(0)
 1370 IFINKEY-97PROCpos(0)
 1380 IFINKEY-98PROCshield(0)
 1390 ENDPROC
 1400 DEFPROCc1
 1410 IFINKEY-73PROCspeed(1)
 1420 IFINKEY-74PROCfire(1)
 1430 IFINKEY-89PROCangle(1)
 1440 IFINKEY-58ORINKEY-42PROCpos(1)
 1450 IFINKEY-106:PROCshield(1)
 1460 ENDPROC
 1470 DEFPROCspeed(p%):ps=1-2*p%
 1480 s%(p%)=s%(p%)+1:sx=192+p%*888
 1490 IFs%(p%)=13 s%(p%)=1:GCOL0,0:MOVEs
x,40:MOVEsx+ps*192,40:PLOT85,sx,120:PLOT
85,sx+ps*192,120
 1500 GCOL0,2:MOVEsx+ps*s%(p%)*16,40
 1510 DRAWsx+ps*s%(p%)*16,120:ENDPROC
 1520 DEFPROCangle(p%):oa=a%(p%)
 1530 ps=1-2*p%:a%(p%)=a%(p%)-1
 1540 IFa%(p%)=6 a%(p%)=13
 1550 ax=64+p%*1152:GCOL0,0:MOVEax,40
 1560 DRAWax+ps*100*c(oa),40+100*s(oa)
 1570 GCOL0,1:MOVEax,40:DRAWax+ps*100*c(
a%(p%)),40+100*s(a%(p%))
 1580 ENDPROC
 1590 DEFPROCpos(p%)
 1600 p%(p%)=p%(p%)+1:IFp%(p%)=3p%(p%)=0
 1610 IFp%=0IFsa%(p%(p%))=0GOTO1600
 1620 IFp%=1IFsn%(p%(p%))=0GOTO1600
 1630 FORJ=8+p%*3TO10+p%*3:VDU19,J,6;0;
 1640 NEXT:VDU19,8+p%*3+p%(p%),1+6*p%;0;
 1650 ENDPROC
 1660 DEFPROCshield(p%)
 1670 IFsh%(p%)=0ORfs%(p%)=1 ENDPROC
 1680 SOUND&101,3,193+8*p%,1
 1690 SOUND&100,4,4,4
 1700 sh%(p%)=sh%(p%)-1:GCOL0,1
 1710 MOVE64+p%*840+sh%(p%)*128,184
 1720 VDU247:fs%(p%)=1
 1730 VDU19,14+p%,2+p%;0;:ENDPROC
 1740 DEFPROCfire(p%):ff%(p%)=1
 1750 r%=RND(1)/128:IFRND(2)=1r%=-r%
 1760 ix(p%)=(s%(p%)+r%)*c(a%(p%))/2.5
 1770 IFp%=1ix(p%)=-ix(p%)
 1780 iy(p%)=(s%(p%)+r%)*s(a%(p%))/2.5
 1790 GCOL3,7:q%=p%(p%)
 1800 px(p%)=144+p%(p%)*170
 1810 py(p%)=672-p%(p%)*170
 1820 IFp%=1px(1)=1280-px(1)
 1830 MOVEpx(p%),py(p%):VDUb%
 1840 SOUNDp%+1,2,150+p%*50,8
 1850 t%(p%)=TIME:ENDPROC
 1860 DEFPROCm(p%):GCOL 3,7
 1870 T%=TIME-t%(p%):t%(p%)=TIME
 1880 MOVE px(p%),py(p%):VDUb%
 1890 px(p%)=px(p%)+ix(p%)*T%
 1900 ix(p%)=ix(p%)+wind
 1910 py(p%)=py(p%)+iy(p%)*T%
 1920 iy(p%)=iy(p%)+grav
 1930 B%=POINT(px(p%)+32,py(p%)-16)
 1940 D%=FALSE:M%=FALSE
 1950 IFB%>10-3*p%IFB%<14-3*p% D%=TRUE E
LSE M%=(B%=6)
 1960 IFB%=15-p%IFfs%(p%EOR1)=1 M%=TRUE:
fs%(p%EOR1)=0:VDU19,15-p%,0;0;
 1970 IFNOT(D%ORM%) MOVEpx(p%),py(p%):VD
Ub%
 1980 IFD%ORM%ORpx(p%)>1280ORpx(p%)<-48O
Rpy(p%)<64:ff%(p%)=0
 1990 IFD%PROCdhit
 2000 IFff%(p%)=0PROCangle(p%):PROCspeed
(p%):PROCpos(p%)
 2010 ENDPROC
 2020 DEFPROCdhit:SOUND0,-10,5+p%,2:SOUN
D0,-15,6-p%,2:I=2
 2030 IFpy(p%)>350I=1:IFpy(p%)>500I=0
 2040 dy=608-150*I:dx=I*170
 2050 IFp%=0dx=1136-dx
 2060 GCOL0,15-p%:MOVEdx,dy:PRINTa$(0)
 2070 IFp%=0sn%(I)=0:IFsn%(0)=0IFsn%(1)=
0IFsn%(2)=0:PROCend(0)
 2080 IFp%=1sa%(I)=0:IFsa%(0)=0IFsa%(1)=
0IFsa%(2)=0:PROCend(1)
 2090 ENDPROC
 2100 DEFPROCd(C,X,Y,M$):FORI=0TO1:PRINT
TAB(X-2,Y+I)CHR$141CHR$(128+C)M$:NEXT:EN
DPROC
 2110 DEFPROCend(p%):GCOL0,0:end=TRUE
 2120 FORI%=640-640*p%TO1280-640*p%STEP1
28
 2130 FORJ%=128TO640STEP128
 2140 GCOL0,1:MOVEI%,J%:PRINTa$(2-p%)
 2150 GCOL0,7:MOVEI%,J%:PRINTa$(4-p%)
 2160 NEXT:NEXT:FORI=0TO3
 2170 P%=(RND(2)-1)*12+(RND(2)-1)*7
 2180 SOUND1,1,P%*4,36
 2190 SOUND&1002,1,P%*4,6
 2200 SOUND2,1,P%*4,30
 2210 SOUND&1003,1,P%*4,12
 2220 SOUND3,1,P%*4,24:NEXT:ENDPROC
 2230 DEFPROCreloc(Q%):CLS:P%=PAGE
 2240 IFP%<=Q%ORP%>&8000 ENDPROC
 2250 L%=TOP-PAGE:*TAPE
 2260 PRINTCHR$129CHR$136"Relocating";
 2270 FORM%=0TOL%-1STEP4
 2280 Q%!M%=P%!M%:NEXT
 2290 PAGE=Q%:A%=138:X%=0:*FX15
 2300 $&100="OLD"+CHR$13+"RUN"+CHR$6+CHR
$13
 2310 FORL%=&100TO&108:Y%=?L%
 2320 Z%=USR&FFF4:NEXT:VDU21:ENDPROC
```

Get it right!

```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = 92B3 3
  50 = BC2B D
  60 = A8DF B
  70 = 48E4 0
  80 = AB3E 1
  90 = ACBD 5
 100 = 1B34 5
 110 = 6D9C D
 120 =  ADF 8
 130 = 2AE1 8
 140 = 344C 5
 150 =  AEE 7
 160 = CE4B A
 170 = 8DC1 9
 180 = 2E03 C
 190 = EDCA C
 200 = 4E12 4
 210 = A347 2
 220 = 686C 6
 230 = 9A84 B
 240 = 3E7F 7
 250 = 529E 0
 260 = FE91 9
 270 = F3CB 8
 280 = 43C2 F
 290 =  E60 4
 300 = 7C50 C
 310 = ED0F 6
 320 =  796 7
 330 = D884 7
 340 =  328 F
 350 = 8FC6 3
 360 = A77C F
 370 = DECC 1
 380 = CDC5 1
 390 = 66A5 8
 400 = 4974 5
 410 = 601F D
 420 = E237 D
 430 = 1613 E
 440 = 6DEA 0
 450 = 9683 E
 460 = 2A49 7
 470 = BA10 6
 480 = 412E A
 490 = A23D F
 500 = 71BA C
 510 = BC3D C
 520 = CB29 7
 530 = 3C82 1
 540 = 71A1 4
 550 = 102B 3
 560 = CDBC 1
 570 = 77B1 C
 580 = 41E6 0
 590 = 6F41 4
 600 = 80DB E
 610 = C80E 2
 620 = 180A C
 630 = 194B C
 640 = E35D F
 650 = B449 E
 660 = 5D38 D
 670 = DF9F E
 680 = 2870 0
 690 = C66A 0
 700 = 1541 F
 710 = 3698 C
 720 = D287 F
 730 =  C32 1
 740 = AAA1 4
 750 = E549 5
 760 = 5632 6
 770 = ED13 6
 780 = 2F38 6
 790 = 3731 5
 800 = 9AE7 5
 810 = D24C 6
 820 = 6ABE 8
 830 = C52B A
 840 = 485A 1
 850 = EBFA 8
 860 = 4A37 8
 870 = 4D77 1
 880 = 3E89 4
 890 = DF79 2
 900 = F8D1 7
 910 = AF92 4
 920 = 9AF6 4
 930 = 2004 9
 940 = 57A4 4
 950 = F1A6 F
 960 = 384D F
 970 = 1839 0
 980 = 9366 4
 990 = 129B B
1000 = E531 9
1010 = D9EE 4
1020 = 83D2 D
1030 = 145A E
1040 = 9C65 D
1050 = 2659 E
1060 = FDF2 B
1070 = C527 0
1080 = 787E 7
1090 = 2A1C D
1100 = 787E 7
1110 = 2E7F 0
1120 = 2466 3
1130 = CCC0 E
1140 = 3AB8 D
1150 = F680 5
1160 = 3582 8
1170 = BD59 B
1180 = A823 0
1190 = 8E3A 6
1200 = 682A 5
1210 = A5EE B
1220 =  BE0 B
1230 = ED0F 0
1240 = FBD0 7
1250 = 238E F
1260 = 1868 A
1270 = ED0F 5
1280 = FF56 0
1290 = 90C6 7
1300 = F55C 3
1310 = E017 3
1320 = 79A0 B
1330 = 749D B
1340 = D7C4 B
1350 = 2D7C 1
1360 = CBE2 C
1370 = F5D0 C
1380 = CA36 7
1390 = ED0F 7
1400 = 64BC 2
1410 =   83 3
1420 = 48AD 0
1430 = FD18 2
1440 = 4C08 8
1450 = AA01 B
1460 = ED0F B
1470 = 58DD 6
1480 = CADE 8
1490 = 85CA A
1500 = 5272 2
1510 = 6255 B
1520 = 20B6 B
1530 = 8DB4 6
1540 = F5B7 8
1550 = ECEB D
1560 = BA49 C
1570 = B4D3 A
1580 = ED0F E
1590 = E47E B
1600 = 6413 E
1610 = DA9E 7
1620 = 1A93 0
1630 = 66E1 8
1640 =  AAB D
1650 = ED0F 3
1660 = 8457 C
1670 = D65A D
1680 = 2136 9
1690 = 6C81 0
1700 = 6694 8
1710 = 3D41 2
1720 = 5E53 E
1730 = D46D D
1740 = 7EF0 9
1750 = DBF1 0
1760 = A81A 6
1770 = 1DE3 8
1780 = 3087 2
1790 =  167 E
1800 = 7DD2 4
1810 =  D08 4
1820 = 7A3D 9
1830 = 92C4 E
1840 = 34DA A
1850 = C8A1 9
1860 =   76 3
1870 = 80AD 9
1880 = 64AA D
1890 = 9DB7 8
1900 = EB54 1
1910 = 1940 E
1920 = 1E8B C
1930 = 4361 B
1940 = EA83 1
1950 = 6212 2
1960 = 2C4E 0
1970 = 3B5B D
1980 = 2EE6 B
1990 = 889F 2
2000 = EA3A 9
2010 = ED0F E
2020 = D7F3 D
2030 = 23DD F
2040 = DDEF 8
2050 = DFD3 5
2060 = B6D2 5
2070 = 1AE5 6
2080 = 51A2 7
2090 = ED0F 5
2100 = 3B7E 9
2110 = F582 6
2120 =  B17 9
2130 = 98AF C
2140 = E843 6
2150 = 2522 5
2160 =  D8E C
2170 = 2AE8 3
2180 =   8E 1
2190 = B105 9
2200 = 18B2 3
2210 = E535 B
2220 = CDD2 B
2230 =  3EE C
2240 = F45F 3
2250 = 3AB1 A
2260 = 9A3B 5
2270 = 5769 E
2280 = E316 B
2290 = AF02 4
2300 = 889C C
2310 = 7ACF 1
2320 = 302A 0
```

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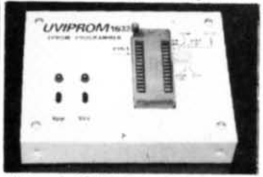

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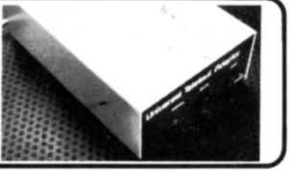

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Ample guidance on technique

AS A keen user of the Hybrid Music 5000 Synthesiser I have developed some techniques and discovered some tips for editing which other Ample users may be interested in:

☐ *When programming new instruments in Notepad for already existing mixes simply MAKE your instrument and type "mix"GET. Then edit the mix in the notepad rather than having to change modules.*

☐ *Plan your piece on paper – draw a diagram of the eight voices and the parts they will correspond to.*

☐ *If you encounter a* No Room *message in Staff Editor when trying to make a word type COMPACT followed by READY and try again. If this fails delete mix as this can be created again easily. You may then have enough memory to MAKE the word.*

☐ *If you have a silent part section – one which does not play – there is no need to MAKE a word.*

☐ *When editing, always finish with an end line as this cuts off unwanted long notes at the end of the piece.*

☐ *When programming a piece, program the bass part first as it is likely to have the steadiest rhythm and other parts can be played along with it to check timing.*

☐ *If you have the Music 4000 Keyboard System disc there are many instruments which you can copy on to the notepad and use in your own pieces.*

☐ *For the best performance once your piece is finished, run it from the main menu and not any of the modules.*

☐ *If your program crashes it is sometimes possible to press Break and SAVE it. After this, take the disc out, turn the micro off and back on, reload the system and see what you've salvaged.*

☐ *Try and avoid using star commands while in Ample.*

☐ *Do not mime on the keyboard while your music is playing as this can result in some strange effects.*

☐ *Favourite instruments can be stored as text files using:*

```
*SPOOL instr1
"strings"TYPE
*SPOOL
```

*The strings instrument can later be added to any program in memory by typing *EXEC instr1.*

Moreover, you could prepare all your instruments before actually starting work on the piece. After creating the instruments type:

```
*SPOOL allinst
WRITE
*SPOOL
```

*Then at a later time when you finish entering a piece, you can load in your previously prepared instruments with *EXEC allinst.*

Ample users should find these routines useful but remember that, when using Ample, it's best to have a plan of action before even switching on the micro.

Finally, does anyone have a really short, sharp bass sound, almost like a drum beat? I can't for the world come up with anything. – **Peter J. Wood, Chryston, Glasgow.**

Win a tenner

WANT to write to The Micro User? The addess is: Letters, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield, SK10 4NP.

Writers of the most interesting letters recieve a £10 prize.

Club for Z88 users

I WAS sorry to see that the Z88 feature in The Micro User *has been discontinued and appreciate that it was probably not popular enough to justify its place.*

So for any Z88 owner who may be interested in getting to know more about their machine, here's the address of the Z88 Users' Club:

Z88 Users' Club,
Mr Woodward (chairman),
68, Wellington Street,
Long Eaton,
Nottingham.
NG10 4NG.

Finally may I say how much I have enjoyed reading the articles in The Micro User *relating to the*

➤

Micros in education

I WOULD like to comment on a number of issues raised in the September issue of The Micro User.

Firstly the so-called trendy authorities which do not place computer assisted learning as a high priority in their schools are in no way denying the importance of the three Rs, but are in fact rejecting wasted time on an expensive resource that has more valuable uses.

The next point I would like to make is that the National Curriculum certainly supports the use of Information Technology, but in the useful form of word processing, databases, spreadsheets and control technology.

This type of software encourages important transferable skills such as re-drafting, analysing, problem solving and understanding of the uses of IT outside education. There is a place for CAL in schools, but it is of limited value and should only be used very selectively.

Finally, I would hope that the use of the micro as a reward is a diminishing, if not almost obsolete, practice.

The view in Tameside is that IT should be accessible to all pupils in a meaningful context within the curriculum. – **Ursula Daniels, Adviser for Information Technology, Tameside L.E.A.**

● Since micros are such scarce and valuable resources in schools most modern software encourages cross-curricula work away from the machine anyway. Fun School 2 itself is actually being used in some areas as the jump-off point for class projects – an excellent use way beyond its design intentions.

In regard to use as a reward there are two further points: Since the children clearly respond positively to the reward – and it is itself further drilling on educational concepts – surely this cannot be a bad thing?

It also encourages familiarity and confidence with a machine the children will be in close contact with throughout the rest of their education and later lives.

Archimedes over the last year or so – it is the only full-size micro I would consider buying. _ **Michael W. Hey, Sandiacre, Nottingham.**

Electron Micro Users

I DON'T know if any of your other readers have noticed but I have found that most, if not all, of the programs published in The Micro User *work on the Electron. Some appear a bit strange at first, due to the lack of Mode 7 on the unexpanded Electron, but most will run without any amendments whatsoever.*

The Micro User *is a good, well laid out magazine, which caters for a lot of readers. Personally speaking I read it from cover to cover because it is so interesting.* – **F. Proffitt, Shevington, Wigan.**

● Many thanks for the praise – we are pleased that you like the magazine. As for the Electron saga did you know that most programs printed in *Electron User* run on the BBC Micro as well without alteration?

Countdown to a game

WHILE I was watching Channel 4's Countdown programme, I was inspired to write a simple routine that works like the Numbers round of the show. In that section you have to work out how to get a specified result from a set of numbers. The program chooses the six numbers and five random operators then displays the numbers and the answer. You then have to work out how to get the result. Press a key and the micro's own solution will be displayed.

```
   10 REM Countdown Game
   20 REM By S.Rehman
   30 MODE7
   40 PRINTTAB(12,0)CHR$14
1"COUNTDOWN  GAME"
   50 PRINTTAB(12,1)CHR$14
1"COUNTDOWN  GAME"
   60 PRINTTAB(14,3)CHR$13
4"by S.Rehman"
   70 PRINT'CHR$(145);STRI
NG$(39,",")
   80 PRINT" Your six numb
ers are : "
   90 *FX 21 0
  100 A%=RND(10):B%=RND(10
):C%=RND(10):D%=RND(10):E%=
RND(10):F%=RND(10)
  110 PRINT'A%,B%,C%
  120 PRINT'D%,E%,F%
  130 PRINT'CHR$(145);STRI
NG$(39,",")
  140 AB$=CHR$(FNsign):BC$
=CHR$(FNsign):CD$=CHR$(FNsi
gn):DE$=CHR$(FNsign):EF$=CH
R$(FNsign)
  150 B$=STR$A%+AB$+STR$B%
+BC$+STR$C%+CD$+STR$D%+DE$+
STR$E%+EF$+STR$F%
  160 IF EVAL B$<0 OR EVAL
B$>1000 THEN GOTO 140
  170 PRINT" Use the above
(in order) to find : ";EVAL
 B$
  180 PRINT'" Press any ke
y for the solution...";
  190 REPEATUNTILGET
  200 PRINT''" The solutio
n is : ";B$
  210 PRINT''
  220 END
  230 DEF FNsign:ON RND(3)
GOTO 240,250,260
  240 =42
  250 =43
  260 =45
```

Cecil – the Countdown micro – sometimes chooses numbers that are very easy. In this listing the range of the answers can be changed by altering the variables in line 160.

If you change the variables in line 100, you might find that you need more than the 30 seconds that Countdown allows for a solution to be found. – **S. Rehman, Aylesbury, Bucks.**

Segments improved

THANK you for printing my Wordwise Plus segment program in the October 1989 issue. However there should be an ENDPROC at the end of the routine and this was missed.

My program – or any other – can be loaded automatically into Wordwise with this text !BOOT file:

```
:SELECT SEGMENT 0
:LOAD TEXT"menu"
:SELECT TEXT
[SPACE]
```

Remember to put a space as your last line to bring the menu back. – **Mathew Shaw, Maidenhead, Berkshire.**

Claw back that space

I COPIED the Caption program from the May 1989 issue of The Micro User. But I cannot make anything work beyond the menu. When I choose an option all I get is No room @ Line 2270.

Please can you help? – **Don Clarke, Nr.Totnes, Devon.**

● The listing is correct as published and runs with PAGE set at &1900 – the normal for a DFS machine.

When programs are entered it's best not to put a space after the line number to save memory. However, for clarity, we list them using LISTO1, so a space is displayed. Your problem is either you've got a rom in your micro, raising page above &1900, or you've entered extra spaces.

Either way, entering PAGE = &1100 before loading the program should cure it. You could put an extra line in the program to do it for you:

```
1 IF PAGE>&1100 THEN PAGE =
&1100: CHAIN "CAPTION"
```

Keep those lids on

I MUST comment on your response in the Problem Solved feature, September 1989 issue, to leaving lids off BBC B micros.

The simple reason we advise our customers not to operate equipment with the covers removed is that the equipment will normally no longer meet the relevant Safety Standards. They normally include the risk of poking items or dropping chains through certain slot sizes. This risk is present with the cover removed and the PSU exposed. – **David Bell, Group Product Manager, Acorn Computers Ltd, Cambridge.**

Desktop toolkit

CAN I please draw your attention to a few points mentioned in the review of Instigator in the October 1989 issue. As you rightly guessed Instigator is a throw back from Arthur, and a major re-write wasn't feasible – unfortunately this is what happens when a completely new operating system is released.

Having said that, Instigator is, to my knowledge, the only toolkit that is

Slow Box letter correction

THANK you for publishing my letter in your August 1989 issue giving a software solution for the two programs published in your May 1989 issue on the subject of the Slow Box. Unfortunately an error seems to have occurred in the last paragraph. This should read: "If the difference between the value of HIMEM for the program's correct mode and the displayed value of LOMEM is ever less than about &200 the program is likely to give 'No room *when run in its correct mode".* – **Glyn D. Willliams, Bala, Gwynedd.**

available from the Desktop.

The use of the term advertising hype is difficult to understand, as at the time of the review we had not advertised the product at all.

The bug mentioned in the review and summary which was responsible for some problems experienced is not a fault with Instigator. In fact it is a major bug in Risc OS itself and is clearly documented on Page 20 of the Instigator manual. – **Bruce Smith, Dabs Press, Manchester.**

● The advertising hype referred to was, in fact, the press release – an advert to the press which did, in the opinion of the reviewer, overrate this software package.

Although the bug is an OS one, either the original programmer should have found a way round it or its existence should have been emphasised more – preferably on screen.

A warning on Page 20 of the manual noticed after the event doesn't compensate for lost work.

Fractals and Equinox combined

£10 Prize letter

AFTER reading your article in the August issue on Fractals, and watching an Equinox programme on the subject, I decided to write a program to produce one. The idea came from Equinox and is:

- ☐ *Draw a triangle*
- ☐ *Find a random point anywhere in the triangle.*
- ☐ *Choose a corner of the triangle at random.*
- ☐ *Plot a point halfway between the random point and the chosen corner.*

You keep on repeating the process until the triangle is full. If you zoom in on any part of it you will find that it goes on and on.

The programs are written for a Master and unfortunately the whole process takes a long time to run. They are easily changed to run on a BBC B by simply replacing the PLOT 129,100,100 in line 40 of Listing I (below) with:

```
MOVE 0,0
MOVE 1280,0
PLOT 85,640,1024
```

Listing I is the Basic program for creating the fractal, but as it takes a long time to run you may wish to save it and continue another time. So I wrote Listing II (right). After typing it don't run it as it will give the error Not found at line 40. Save *it and then enter and run the following short program:*

```
   10 MODE2:GCOL 0,6:DRAW 1
280,0:DRAW 640,1024:DRAW 0,
0:PLOT 129,100,100
   20 *SAVE SCREENB 3000 80
00
```

You can of course change the PLOT 129,100,100 to the aforesaid if you're not using a Master. All this program does is to create a dummy file by the name of SCREENB.

```
   10 REM Listing II by S.
Cockle
   20 ONERRORPROCERROR
   30 MODE2:VDU23;8202;0;0
;0;
   40 OSCLI("LOAD SCREENB
3000"):DIMX%(3),Y%(3):X%(1)
=0:Y%(1)=0:X%(2)=640:Y%(2)=
1024:X%(3)=1280:Y%(3)=0
   50 GCOL0,6:DRAW1280,0:D
RAW640,1024:DRAW0,0
   60 X%=RND(1280):Y%=RND(
1024)
   70 IF POINT(X%,Y%)=6THE
N GCOL0,4:ELSEIF POINT(X%,Y
%)=4THENGCOL0,1:ELSE60
   80 N%=RND(3)
   90 A%=(X%+X%(N%))/2:B%=
(Y%+Y%(N%))/2
  100 PLOT69,A%,B%:GOTO60
  110 DEFPROCERROR
  120 *SAVE SCREENB 3000 8
000
  130 END
```

Once you have done this you can run Listing II. When you want to save the screen press Escape, running the program again will continue from where you left off.

*The OSCLI command in line 40 of listing II may cause an error with some micros, you can replace this with *LOAD SCREENB 3000. All it means is that the next set of commands will have to be on a new line.* – **S. T. Cockle (age 14), Coleford, Gloucs.**

```
   10 REM Listing I by S.C
ockle
   20 MODE2:VDU23;8202;0;0
;0;
   30 DIMX%(3),Y%(3):X%(1)
=0:Y%(1)=0:X%(2)=640:Y%(2)=
1024:X%(3)=1280:Y%(3)=0
   40 GCOL0,6:DRAW1280,0:D
RAW640,1024:DRAW0,0:PLOT129
,100,100
   50 X%=RND(1280):Y%=RND(
1024)
   60 IF POINT(X%,Y%)=6THE
N GCOL0,4:ELSEIF POINT(X%,Y
%)=4THENGCOL0,1:ELSE50
   70 N%=RND(3)
   80 A%=(X%+X%(N%))/2:B%=
(Y%+Y%(N%))/2
   90 PLOT69,A%,B%:GOTO50
  100 END
```

Listing I

Making most of the disc

WHEN I received the disc which came on subscription with the September issue of The Micro User *I found that three programs wouldn't work – Collidas, Flick Book and Body Building.*

Could you please tell me what's wrong? – **B. Bellkirk, Congleton, Cheshire.**

● We try to make the disc as user-friendly as possible, but as they contain such a variety of routines they may not all work on all machines. Also, some programs may need modifications before they work. You should always look at the corresponding article before running the software from the disc.

In the case of the three programs you mention, Collidas is only part of a program and is designed to be merged with a previously published routine.

Flick Book doesn't run as it is – details are in the article – and Body Building needs some hardware to make it work. If you press Copy when a menu item is highlighted you'll be presented with a short piece of explanatory text about that program.

Debugging a segment

MATTHEW Shaw's excellent Wordwise Plus program in the October 1989 letters generates a bug when used with my version of Wordwise Plus – 1.4A – and Master 128k.

If I call the segment program from the Wordwise Plus main menu the program executes as intended.

But if the segment program is called from the edit mode the cursor vanishes and the cursor keys lock up.

Escape has to be pressed twice to clear the bug and return to edit mode.

To overcome this problem, insert the following two lines into the program – the bracketed ones are from the original listing to show the position:

```
[SELECT TEXT]
*FX138,0,27
IF (?&8F AND 1)=1 THE
N *FX138,0,27
[TYPE "|GOC"+B$]
```

This modification cures this bug and also returns you to the edit mode, whether you have executed the program from there or from the main menu.
– **Donna Amati, Guernsey, Channel Islands**

Spaced out belle offloads

The light hearted saga of Bob and Trev continues as Andrea heads for orbit

Dear Trev

It's been quite exciting at the Rogues recently. Colin, our ex-Trappist monk – he was expelled for talking in his sleep – has finally written the definitive guide to the difference between Basic I and II – and I don't mean I. He read it to us at the last meeting. It went like this:

> *❛ For openers, if you need to put something in a file and you don't know if you've got Basic I or Basic II and want to know which one of the two you've got, press Break and then enter REPORT. If you've put it in right it'll output either '81 or '82, the latter being Basic II the former Basic I.*
>
> *Basically to open up a file for input in Basic II you have two choices OPENUP or OPENIN – it's up to you. But, if you want to output to the file as well, OPENIN is out. But, as I said, if you want to input only then either way is open: OPENIN or OPENUP.*
>
> *Don't be put out by that, you can simply use OPENUP to input and output but not at the same time. And not if you've got Basic I. In that case you use OPENIN instead of the OPENUP, but, of course, this isn't the same as Basic II's OPENIN, though I's OPENIN is the same as II's OPENUP. OPENOUT is the same. ❜*

The news is that he's now got a job as a staff writer at The Micro User.

After that, is it any wonder that Andrea's trying to become the first Englishwoman in space – despite being told that bells won't ring in a vacuum. She's got a grant from Romchester Polytechnic's School of Campanology and Women's Problems to study the mechanics of pulling bell ropes in freefall – apparently it's Nasa's last great problem.

The Russians offered her money for the same thing but she felt that there were too many strings attached, though since they told her that she's a dead ringer for Valentina Tereskova she's been over the moon. Of course it's going to cost a lot of money, but all her fellow/fellowess bell-ringers have got together to raise funds. Andrea's been quite touched by how keen they've been to put her into orbit.

The most successful scheme was a barbecue – known as a Bell Fry. I suggested a sponsored silence on Sunday mornings but they said that the Sabbath bells were a tradition and who were they to ring the changes. My next suggestion of a sponsored peal was declared sexist.

Anyway it's given me bit of peace, because she's away in London having all sorts of tests. She's already filled in a psychological questionnaire – apparently he asked too many personal ones.

And it means that she's missed the great excitement of the month when Doreen discovered you can't download software from Ceefax anymore. Of course it was Clive who told her.

"It's disgusting", she screamed, "us teachers need that software desperately".

"I didn't know you could download software at school", I erred.

"We can't, but we might have wanted to".

"But you have to have an adaptor", pointed out Clive.

"Not if I don't want", came the retort, "and it's spelled adapter."

"Don't you mean spelt?"

I'll miss out the ensuing argument which brought in disks versus discs and questions about whether The Micro User *thought it might run short of capital letters when it decided to use Basic. And if it was a cost cutting exercise why did they always call it* The Micro User *instead of just plain* Micro User *like everyone else? In the end they agreed to differ. As Clive said:*

"To er is human. I can adapt. It's just 'er way."

"I'll miss all the free software," Doreen persisted despite the fact that she gets more than enough from Clive who claims that The Micro User *only put it on Ceefax to counter rumours that they couldn't give it away.*

"And all the educational notes", she wailed, though why the BBC should waste their time with things like "Little Johnny can't do cross-country 'cause he's got the runs" I'll never know.

It was pointless arguing. A week ago she thought that teletext was the Radio Times, now she was in full mourning for the passing of downloadable software. Despite being told that the BBC was in desperate trouble – look at the magazines they put their name on – she just wouldn't see facts. The service is gone. As Andrea might say, "Ask not for whom the bell tolls....". Provided it's not in space it tolls for telesoftware, Basic I and a lot, lot more. I'm getting old.

Cheers,

Bob

P.S. No I'm not. I've just read that flared trousers are coming back in fashion. I knew I should have hung on to that Acorn Atom....

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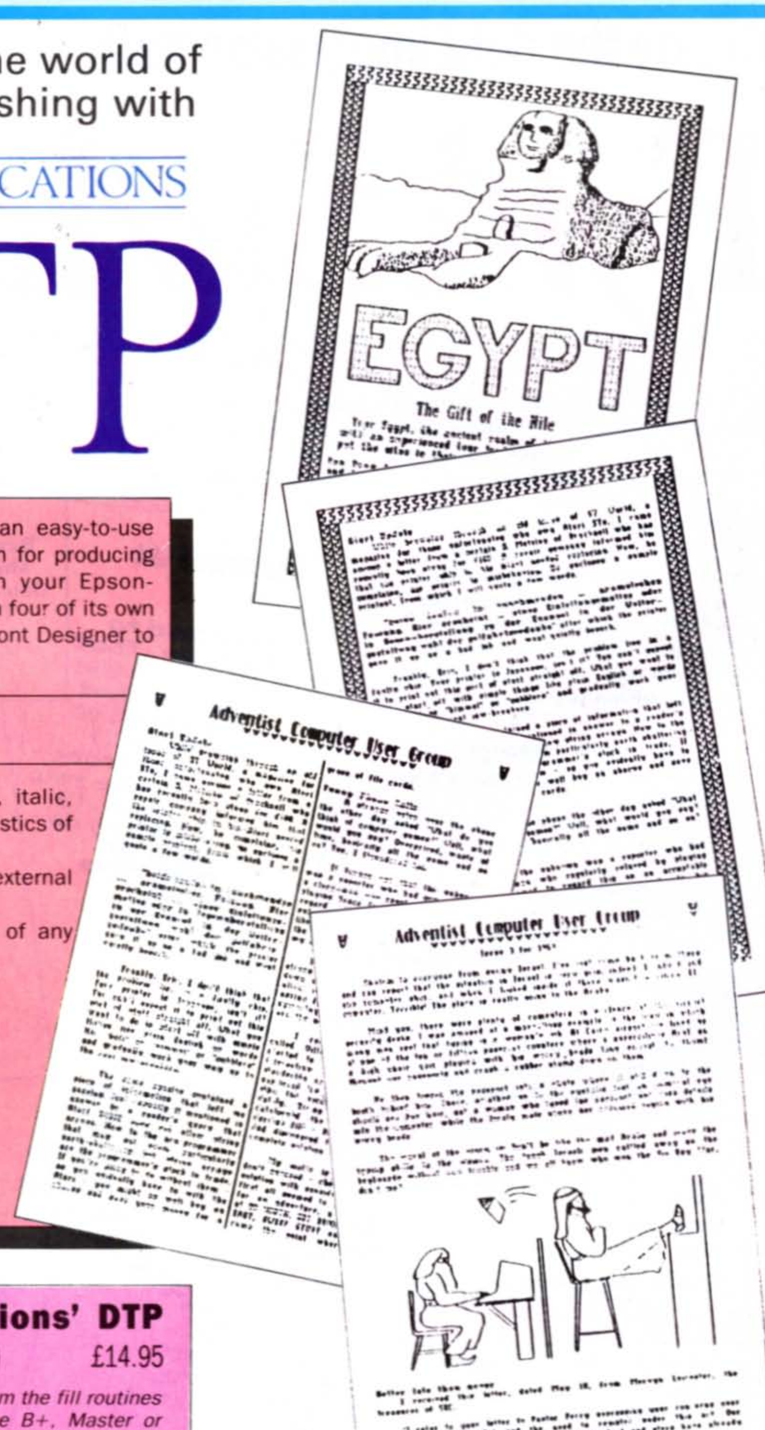

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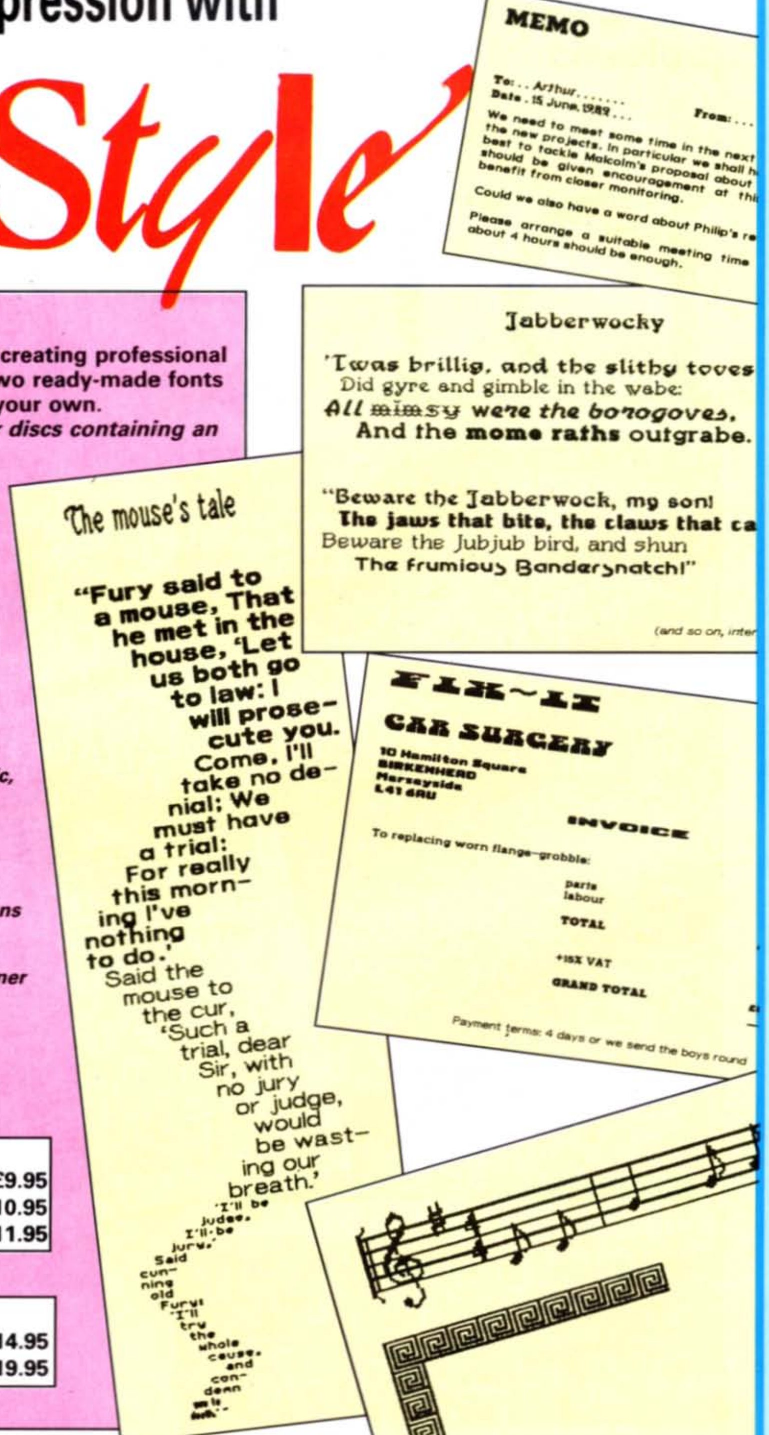

MEMO

To: .. Arthur........
Date . 15 June, 1989 ...
From: ...

We need to meet some time in the next the new projects. In particular we shall h best to tackle Malcolm's proposal about should be given encouragement at thi benefit from closer monitoring.

Could we also have a word about Philip's re

Please arrange a suitable meeting time about 4 hours should be enough.

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the **mome raths** outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that ca
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"

(and so on, inter

The mouse's tale

"Fury said to a mouse, That he met in the house, 'Let us both go to law: I will prose-cute you. Come, I'll take no de-nial: We must have a trial: For really this morn-ing I've nothing to do.' Said the mouse to the cur, 'Such a trial, dear Sir, with no jury or judge, would be wast-ing our breath.' 'I'll be judge, I'll be jury,' Said cun-ning old Fury: 'I'll try the whole cause, and con-demn [illegible]'

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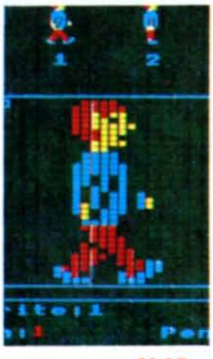

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(see page 118)

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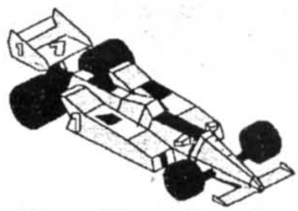

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◀ From Page 77

```
:GOTO 600
  750 IF B%=19 THEN BPUT#D%,&1D:bold%=0:
GOTO 600
  760 IF B%=20 THEN BPUT#D%,&1C:uline%=0
:GOTO 600
  770 IF B%=16 THEN cent%=1:BPUT#D%,128:
BPUT#D%,ASC"C":BPUT#D%,ASC"E"
  780 IF B%=17 THEN right%=1:BPUT#D%,128
:BPUT#D%,ASC"R":BPUT#D%,ASC"J"
  790 IF B%=23 THEN cent%=0
  800 IF B%=24 THEN right%=0
  810 GOTO 600
  820 CLOSE#0
  830 END
  840 :
  850 DEFPROCmargins(head$,no%)
  860 IF option$="1" THEN BPUT#D%,128 EL
SE BPUT#D%,2
  870 BPUT#D%,ASC(LEFT$(head$,1)):BPUT#D
%,ASC(RIGHT$(head$,1))
  880 no$=STR$(no%)
  890 FOR I%=1 TO LEN(no$)
  900 BPUT#D%,ASC(MID$(no$,I%,1))
  910 NEXT
  920 IF option$="1" THEN BPUT#D%,13 ELS
E BPUT#D%,term%
  930 ENDPROC
  940 :
  950 DEFPROCruler
  960 A%=BGET#H%
  970 lm%=BGET#H%
  980 IF start%=1 THEN BPUT#D%,13
  990 PROCmargins("LM",lm%)
 1000 rm%=BGET#H%-lm%
 1010 A%=BGET#H%:A%=BGET#H%:A%=BGET#H%
 1020 tno%=0
 1030 REPEAT
 1040 trule%(tno%)=BGET#H%:tno%=tno%+1
 1050 UNTIL trule%(tno%-1)=&87
 1060 tno%=0
 1070 BPUT#D%,&81:BPUT#D%,ASC".":BPUT#D%
,ASC"."
 1080 FOR I%=1 TO rm%-1
 1090 IF I%=trule%(tno%)-lm%+1 THEN BPUT
#D%,ASC"*":tno%=tno%+1 ELSE BPUT#D%,ASC"
."
 1100 NEXT
 1110 BPUT#D%,ASC"<"
 1120 BPUT#D%,13
 1130 ENDPROC
 1140 :
 1150 DEFPROCnewline
 1160 PTR#H%=PTR#H%-2
 1170 IF BGET#H%<>&87 THEN BPUT#D%,13
 1180 B%=BGET#H% MOD 128
 1190 IF cent%=1 THEN BPUT#D%,128:BPUT#D
%,ASC"C":BPUT#D%,ASC"E"
 1200 IF right%=1 THEN BPUT#D%,128:BPUT#
D%,ASC"R":BPUT#D%,ASC"J"
 1210 IF uline%=1 THEN BPUT#D%,&1C
 1220 IF bold%=1 THEN BPUT#D%,&1D
 1230 ENDPROC
 1240 :
 1250 DEFPROCwwmargins
 1260 hp%=hp%*ls%
 1270 tm%=ts%*ls%
 1280 fp%=(fp%-pl%+bs%)*ls%
 1290 bm%=bs%*ls%
 1300 IF hp%<>3 THEN PROCmargins("HP",hp
%)
 1310 IF fp%<>3 THEN PROCmargins("FP",fp
%)
 1320 IF tm%<>6 THEN PROCmargins("TS",tm
%)
 1330 IF bm%<>6 THEN PROCmargins("BS",bm
%)
 1340 IF ls%<>1 THEN PROCmargins("LS",ls
%)
 1350 IF pl%<>66 THEN PROCmargins("PL",p
l%)
 1360 ENDPROC
 1370 :
 1380 DEFPROCwwtext
 1390 B%=BGET#H%
 1400 IF B%=255 THEN ENDPROC
 1410 IF B%=&85 THEN PROCwwruler:GOTO 13
90
 1420 B%=B% MOD 128
```

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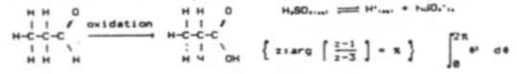

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```
 1430 IF B%>31 THEN BPUT#D%,B%:GOTO 1390
 1440 IF B%=13 THEN BPUT#D%,B%:GOTO 1390
 1450 IF B%=9 THEN BPUT#D%,tab%:GOTO 139
0
 1460 IF B%=30 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=31:GOTO 1390
 1470 IF B%=28 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=29:GOTO 1390
 1480 IF B%=26 THEN REPEAT:A%=BGET#H%:UN
TIL A% MOD 128=27:GOTO 1390
 1490 IF B%=1  THEN PROCcommand("BP"):A%
=BGET#H%:A%=BGET#H%:GOTO 1390
 1500 IF B%=2  THEN A%=BGET#H%:no$=STR$(
BGET#H%+1):PROCcommand("CP"+no$):GOTO 13
90
 1510 IF B%=3  THEN PROCcommand("PP"):GO
TO 1390
 1520 IF B%=18 THEN PROCcommand(just$):G
OTO 1390
 1530 IF B%=27 THEN PROCcommand(nojust$)
:GOTO 1390
 1540 IF B%=14 THEN PROCwordhigh(0):GOTO
 1390
 1550 IF B%=21 THEN PROCwordhigh(15):GOT
O 1390
 1560 IF B%=16 THEN PROCcommand("CE"):GO
TO 1390
 1570 IF option$="2" OR option$="4" THEN
 PROCnotplus:GOTO 1390
 1580 IF B%=11 THEN PROCcommand("DS"):GO
TO 1390
 1590 IF B%=12 THEN PROCcommand("US"):GO
TO 1390
 1600 IF B%=19 THEN PROCcommand("DE"):GO
TO 1390
 1610 IF B%=20 THEN PROCcommand("UE")
 1620 GOTO 1390
 1630 :
 1640 DEFPROCwwruler
 1650 A%=BGET#H%
 1660 lm%=BGET#H%
 1670 PROCmargins("LM",lm%)
 1680 rm%=BGET#H%-lm%
 1690 PROCmargins("LL",rm%)
 1700 A%=BGET#H%:A%=BGET#H%:A%=BGET#H%
 1710 tno%=0
 1720 REPEAT
 1730 trule%(tno%)=BGET#H%:tno%=tno%+1
 1740 UNTIL trule%(tno%-1)=&87
 1750 IF tno%=1 THEN ENDPROC
 1760 BPUT#D%,2:BPUT#D%,ASC"D":BPUT#D%,A
SC"T"
 1770 FOR I%=0 TO tno%-2
 1780 no%=trule%(I%)-lm%
 1790 IF no%<=0 OR no%>=rm% THEN GOTO 18
50
 1800 no$=STR$(no%)
 1810 FOR J%=1 TO LEN(no$)
 1820 BPUT#D%,ASC(MID$(no$,J%,1))
 1830 NEXT
 1840 BPUT#D%,ASC","
 1850 NEXT
 1860 PTR#D%=PTR#D%-1:BPUT#D%,term%
 1870 ENDPROC
 1880 :
 1890 DEFPROCcommand(text$)
 1900 BPUT#D%,2
 1910 FOR I%=1 TO LEN(text$)
 1920 BPUT#D%,ASC(MID$(text$,I%,1))
 1930 NEXT
 1940 BPUT#D%,term%
 1950 ENDPROC
 1960 :
 1970 DEFPROCwordhigh(no%)
 1980 ptr%=PTR#H%:PTR#H%=256+no%
 1990 BPUT#D%,2
 2000 IF option$="4" com$="CC" ELSE com$
="OC"
 2010 I%=BGET#H%
 2020 FOR J%=1 TO I%
 2030 com$=com$+STR$(BGET#H%)+","
 2040 NEXT
 2050 com$=LEFT$(com$,LEN(com$)-1)
 2060 PROCcommand(com$)
 2070 PTR#H%=ptr%
 2080 ENDPROC
 2090 :
 2100 DEFPROCnotplus
 2110 IF B%=11 THEN PROCwordhigh(30):END
PROC
 2120 IF B%=12 THEN PROCwordhigh(90):END
PROC
 2130 IF B%=19 THEN PROCwordhigh(45):END
PROC
 2140 IF B%=20 THEN PROCwordhigh(105)
 2150 ENDPROC
```

Get it right!

```
  10 =    0 0  440 = DF3A C  870 = 865C 8 1300 = 1B76 4 1730 = 1777 6
  20 =    0 0  450 = 3206 F  880 = AFD3 E 1310 = F359 8 1740 = AFFC 4
  30 =    0 0  460 = 99F8 B  890 =  371 8 1320 = A170 D 1750 = 5451 2
  40 = E76A A  470 = 732E 1  900 = 1589 7 1330 = 1924 9 1760 = 5E57 4
  50 = 62A7 7  480 = EEAD E  910 = 2C83 9 1340 = 3592 1 1770 = EF34 B
  60 = 8AFC 3  490 = 72E7 F  920 = DC59 8 1350 = 5175 6 1780 = E5EC A
  70 = 4137 0  500 = 7F33 5  930 = ED0F 1 1360 = ED0F 4 1790 = 56FD 5
  80 = EF3A 7  510 = BF4C 0  940 = 9719 F 1370 = 9719 3 1800 = AFD3 1
  90 = C44B 0  520 = 5763 4  950 = 52AD 5 1380 = 9F89 C 1810 = CCD4 4
 100 = 2B6E 0  530 = C767 C  960 = BF10 5 1390 = 6792 0 1820 = DB69 9
 110 = 8673 F  540 =  6B4 8  970 = 1F82 6 1400 = 3FAE 6 1830 = 2C83 6
 120 = 7A85 B  550 = 5175 D  980 =  A44 2 1410 = BE03 7 1840 = A647 6
 130 = B1D8 7  560 = 4F88 2  990 = 4E29 4 1420 = 3370 E 1850 = 2C83 5
 140 = DF50 5  570 = A153 B 1000 = 54C6 2 1430 = 91D5 2 1860 = BCE2 2
 150 = 3DF1 C  580 = E7C3 0 1010 = 5359 3 1440 = 935C A 1870 = ED0F 3
 160 = D273 7  590 = E7DA A 1020 = 30D9 5 1450 = 9A2A 7 1880 = 9719 D
 170 = 71B7 4  600 = 6792 E 1030 = BFBA 2 1460 = C78D B 1890 = 85AC 0
 180 = 50D1 D  610 = F5A4 4 1040 = 1777 7 1470 = F4ED 0 1900 = 9D12 E
 190 = 6561 C  620 = 66F2 5 1050 = AFFC 6 1480 = B3ED 6 1910 = B832 2
 200 = EAD0 9  630 = CE6A D 1060 = 30D9 7 1490 = 35C8 7 1920 = CEC5 B
 210 = EC23 8  640 =  5AF B 1070 = 1911 4 1500 = B71F E 1930 = 2C83 1
 220 = D929 D  650 = 4E01 1 1080 = B0BB 7 1510 = 974C E 1940 = 54B9 5
 230 = 6047 B  660 = 1859 2 1090 = 90BB F 1520 = E2AE 9 1950 = ED0F B
 240 = 44A1 1  670 = 2B39 C 1100 = 2C83 A 1530 = 81FC 4 1960 = 9719 2
 250 = 6774 7  680 = 6C39 E 1110 = A534 6 1540 = E0DA 8 1970 = F2D9 6
 260 = 14BA 2  690 = D8B9 0 1120 = 1377 5 1550 = 8096 F 1980 = 8D44 5
 270 = 1619 5  700 = EF1D 6 1130 = ED0F 5 1560 = 32D3 1 1990 = 9D12 2
 280 = 6E4C 0  710 =  270 2 1140 = 9719 1 1570 = D119 E 2000 = 2040 1
 290 = 881F B  720 = EBC6 C 1150 = CF68 2 1580 = 346A 7 2010 = 2CBD 7
 300 = 4785 6  730 = 6780 1 1160 = 2F7E 5 1590 = 77C2 4 2020 = 453D F
 310 =  D83 3  740 = 5391 8 1170 = BCA5 E 1600 = DEA1 F 2030 = 5389 D
 320 = 1377 3  750 = 8B63 B 1180 = 1D2D 6 1610 = E4F7 A 2040 = 2C83 9
 330 = F566 C  760 = 5C61 D 1190 = B57E F 1620 = D51A 7 2050 = 9059 0
 340 = CD9E F  770 = 2983 4 1200 = 86D5 1 1630 = 9719 2 2060 = 597E 5
 350 = 391F C  780 = 25D0 8 1210 =  FD7 6 1640 = DC40 7 2070 = 82BF 5
 360 = 8460 8  790 = 1D9A 5 1220 = 1365 1 1650 = BF10 A 2080 = ED0F 1
 370 = 538F 8  800 = 170A 7 1230 = ED0F 9 1660 = 1F82 F 2090 = 9719 B
 380 = 8BE0 9  810 =  ACE 9 1240 = 9719 2 1670 = 4E29 5 2100 = B5A3 4
 390 = BF10 6  820 = 9EE3 8 1250 = 4AE0 3 1680 = 54C6 8 2110 = C9CF E
 400 = 1A71 F  830 = FD2E 8 1260 = 85C2 A 1690 = 4FB5 5 2120 = FD61 7
 410 = 69E4 F  840 = 9719 F 1270 = 946B 5 1700 = 5359 1 2130 = 8260 3
 420 = 3D16 3  850 = 5A58 9 1280 = 2E47 C 1710 = 30D9 A 2140 = C729 5
 430 =  451 1  860 = 9713 D 1290 = A6FC 0 1720 = BFBA B 2150 = ED0F B
```

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(The Fourth Dimension)

Following the success of the superb White Magic, The Fourth Dimension have now released an easy to use level designer plus 32 new challenging levels. The designer allows you to create infinite numbers of screens and the new levels are harder than the originals for those who are ready for a real challenge.

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E - Type

(The Fourth Dimension)

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Holed Out Designer	(4th Dimension)	*19.95*
E-Type	(The 4th Dimension)	*19.95*
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Interdictor	(Clares)	*29.95*
Startrader	(Gem)	*16.95*
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* = Due for release 6th December, 1989

All the above games will work on Archimedes A3000, 310 an 400 series.

HOLED OUT EXTRA COURSES

Due to overwhelming public demand The 4th Dimension has now produced 2 volumes of extra courses for their superb 3D golf game Holed Out. Each volume contains 2 superbly designed brand new courses plus the original Holed Out program; therefore you do not need the original Holed Out in order to play them.

"I play golf and this game is the closest thing I've seen to the real game on a computer". *Archive, June 1989*
"I wouldn't have thought it possible to get a better simulation out of the beeb." *BBC Acorn User, June 1989*
"The 3D perspective graphics are stunning" *Electron User GOLDEN GAME June '89*
"Holed Out is great.....The game plays very well and the graphics are superb."
Popular Computing Weekly, March 1989
"The best golf simulation I've ever seen on any Acorn machine." *The Micro User, June 1989*
"The Electron version is brilliant - it's almost the same as playing at Gleneagles. Unreservedly recommended."
A & B Computing Game of the Month, June 1989

Prices above and opposite

ARCADE SOCCER

(The Fourth Dimension)

A brilliant soccer game of the quality that only The Fourth Dimension could produce. Superb graphics, League System, throw-ins, corners, diving goalies, superfast action and much, much more. It's as near to the real thing as you can get. "HIGHLY RECOMMENDED". You can play against the computer or a friend.

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Enhanced Archimedes version will be available late October at £19.95

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from The Fourth Dimension

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U.I.M. is disc only and will run on BBC B or B+ with sideways RAM and Master Series Computers. The full colour Archimedes version is due for release 6th December.

Prices above and opposite

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Paperboy M	-	11.95	-
Airwolf	4.95	-	-
THE FOURTH DIMENSION			
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Holed Out (3D Golf) M	9.95	11.95	12.95
Holed Out Extra Courses Vol 1 M	9.95	11.95	12.95
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White Magic M	9.95	12.95	13.95
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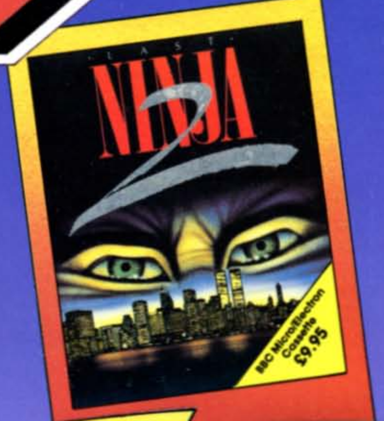
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